



Fiscal Year 2021
Actuarial Valuation Report
for the
New York City
Board of Education
Retirement System

JUNE 30, 2019 (LAG) ACTUARIAL VALUATION

prepared by the
New York City
Office of the Actuary

2021



OFFICE OF THE ACTUARY

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SHERRY S. CHAN
CHIEF ACTUARY

December 29, 2021

Board of Trustees
New York City Board of Education Retirement System
65 Court Street, Room 1602
Brooklyn, NY 11201-4965

Re: Fiscal Year 2021 Actuarial Valuation Report (Report)

Dear Trustees:

This Report presents the results of the June 30, 2019 (Lag) actuarial valuation of the benefits under both the New York City Board of Education Retirement System (BERS) Qualified Pension Plan and Group Life Insurance Plan (collectively, the Plan). This valuation, known as the June 30, 2019 (Lag) valuation, forms the basis for determining the statutorily-required contribution (Statutory Contribution) of \$182,983,084 for Fiscal Year 2021 (i.e. for the period beginning July 1, 2020 and ending June 30, 2021). It is not intended, nor necessarily suitable, for other purposes. Calculations made for other purposes may differ significantly from those shown herein.

Results of the June 30, 2018 (Lag) actuarial valuation are shown in this Report for comparative purposes. Other historical information that the Actuary believes useful is also included.

The June 30, 2019 (Lag) and June 30, 2018 (Lag) actuarial valuations are based upon census data as of those dates submitted by the Plan's administrative staff and the employers' payroll service provider. Financial information was provided by BERS and the Office of the Comptroller as of June 30, 2019 and June 30, 2018.

Consistent with Actuarial Standards of Practice, the Office of the Actuary has reviewed census data and financial information for consistency and reasonability but has not audited it. The accuracy of the results and calculations presented in this Report are dependent on the accuracy of this census data and financial information. To the extent any such data or information provided is materially inaccurate or incomplete, the results contained herein will require revision.

A summary of the benefits available under the terms of the Plan is shown in SECTION VIII – SUMMARY OF PLAN PROVISIONS. The benefits under the Plan are unchanged from the prior valuation.

A summary of the actuarial methods and assumptions is shown in SECTION XI – ACTUARIAL ASSUMPTIONS AND METHODS. The actuarial assumptions and methods used for the June 30, 2019 valuation have changed from the prior valuation, and were presented in the memorandum titled “Proposed Changes to Actuarial Assumptions and Methods (Revised 2021 AM)” dated July 16, 2021 and adopted by the Board of Trustees at the September 23, 2021 Board meeting. Details describing these changes can be found later in this Report.

This Report does not present Governmental Accounting Standards Board (GASB) results. The Office of the Actuary published the Fiscal Year 2021 GASB67 and GASB68 results in a report dated September 24, 2021, which is available on the website of the Office of the Actuary (www.nyc.gov/actuary).

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

Best Regards,



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

SSC/eh

cc: Ms. Melissa Chacko – New York City Office of the Actuary
Mr. Craig Chu – New York City Office of the Actuary
Mr. Michael Hunter - New York City Office of the Actuary
Mr. Sanford Rich - New York City Board of Education Retirement System
Mr. Michael Samet - New York City Office of the Actuary
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SECTION I – EXECUTIVE SUMMARY

This Report presents the results of the June 30, 2019 (Lag) actuarial valuation of the New York City Board of Education Retirement System (BERS) and Group Life Insurance Plan (collectively, the Plan).

The purposes of the valuation are:

- To determine the actuarially-required contribution (Actuarial Contribution) for Fiscal Year 2021 (i.e. July 1, 2020 to June 30, 2021),
- To measure the funding progress of the Plan,
- To disclose the census data and financial information used in the valuation, and
- To disclose the actuarial assumptions and actuarial methods used to determine the Actuarial Contribution.

The statutorily-required contribution (Statutory Contribution) is also shown and compared to the Actuarial Contribution in historical years.

This Report does not provide financial and accounting information required by current GASB standards. That information is provided in a separate report.

Future measurements of this information may differ from current measurements for many reasons including, but not limited to, experience differing from economic or demographic assumptions, changes in actuarial assumptions and methods, and changes in applicable statute and plan provisions. These and additional risks may be present for the Plan. A further discussion is presented in SECTION VII – RISK AND UNCERTAINTY for consideration.

Table I-1 Executive Summary

Presented in **Table I-1** are the principal results of the June 30, 2019 (Lag) actuarial valuation and, for comparative purposes, the June 30, 2018 (Lag) actuarial valuation.

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM		
SUMMARY OF VALUATION RESULTS		
Valuation Date	June 30, 2019 (Lag)	June 30, 2018 (Lag)
Fiscal Year	2021	2020
Funded Status		
1. Accrued Liability	\$ 5,306,985,850	\$ 5,103,583,076
2. Actuarial Value of Assets (AVA) ¹	4,991,832,000	3,908,833,000
3. Unfunded Accrued Liability (AVA Basis) (1. - 2.)	\$ 315,153,850	\$ 1,194,750,076
4. Funded Ratio (AVA Basis) (2. / 1.)	94.1%	76.6%
5. Market Value of Assets (MVA) ¹	4,991,832,000	4,672,903,000
6. Unfunded Accrued Liability (MVA Basis) (1. - 5.)	\$ 315,153,850	\$ 430,680,076
7. Funded Ratio (MVA Basis) (5. / 1.)	94.1%	91.6%
Contribution		
1. Normal Cost	\$ 145,648,691	\$ 139,073,924
2. Unfunded Accrued Liability	17,462,316	103,303,104
3. Administrative Expenses	19,872,029	15,126,419
4. Late Contribution Interest	48	0
5. Actuarial Contribution (1. + 2. + 3. + 4.)	\$ 182,983,084	\$ 257,503,447
6. Statutory Contribution	\$ 182,983,084	\$ 257,503,447
Participant Data		
1. Active Members		
a. Number	25,825	25,864
b. Annual Salary	\$ 1,353,266,355	\$ 1,280,302,470
c. Average Salary	\$ 52,401	\$ 49,501
2. Active Off Payroll Members ²	11,422	10,525
3. Terminated Vested Members	2,019	1,934
4. Retirees and Beneficiaries		
a. Number	18,502	18,041
b. Total Annual Benefits	\$ 267,161,833	\$ 253,421,602
c. Average Benefit	\$ 14,440	\$ 14,047

¹ Actuarial Value of Assets and Market Value of Assets are rounded to the nearest thousand.

² Represents members no longer on payroll, but not otherwise classified.

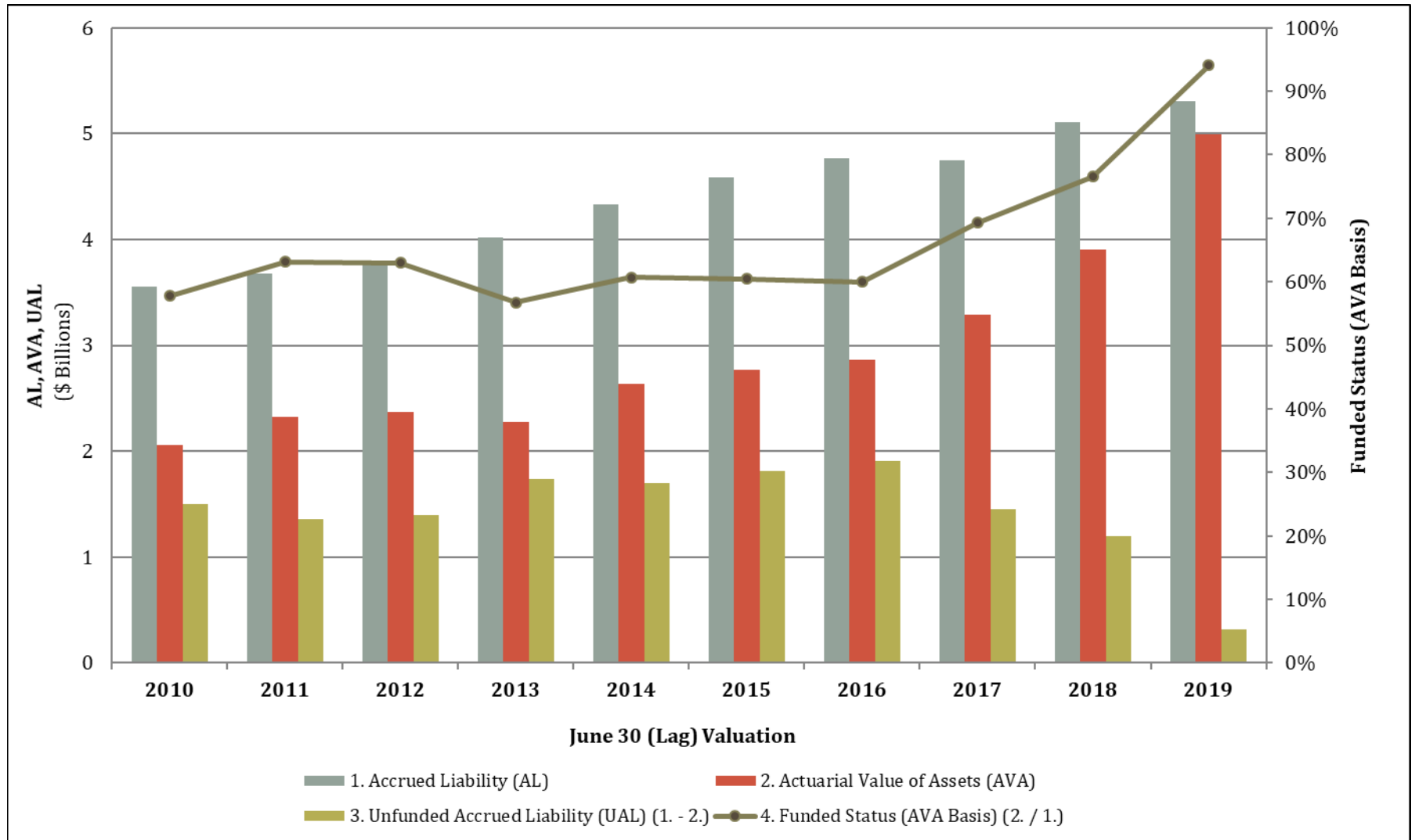
Table I-2
Actuarial Liabilities

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM		
ACTUARIAL LIABILITIES BY STATUS		
Valuation Date	June 30, 2019 (Lag)	June 30, 2018 (Lag)
Fiscal Year	2021	2020
Accrued Liability		
1. Active Members	\$ 2,449,040,531	\$ 2,381,162,243
2. Active Off Payroll Members ¹	97,203,371	89,623,631
3. Terminated Vested Members	79,591,995	70,553,757
4. Retirees and Beneficiaries	<u>2,680,149,953</u>	<u>2,561,243,445</u>
5. Accrued Liability Pre-Adjustments (1. to 4.)	\$ 5,305,985,850	\$ 5,102,583,076
6. Actuarial Adjustments ²	<u>1,000,000</u>	<u>1,000,000</u>
7. Total Accrued Liability (AL) (5. + 6.)	\$ 5,306,985,850	\$ 5,103,583,076
Present Value of Benefits		
1. Active Members	\$ 4,024,057,936	\$ 3,842,586,084
2. Active Off Payroll Members ¹	97,203,371	89,623,631
3. Terminated Vested Members	79,591,995	70,553,757
4. Retirees and Beneficiaries	<u>2,680,149,953</u>	<u>2,561,243,445</u>
5. Present Value of Benefits (1. to 4.)	\$ 6,881,003,255	\$ 6,564,006,917
6. Actuarial Adjustments ²	<u>1,000,000</u>	<u>1,000,000</u>
7. Total Present Value of Benefits (5. + 6.)	\$ 6,882,003,255	\$ 6,565,006,917

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

² Related to actuarial loading adjustments.

Graph I-3
Historical Funded Status



SECTION II – MARKET AND ACTUARIAL VALUES OF ASSETS

Information on the Market Value of Assets (MVA) of the Plan is provided by the Office of the Comptroller. An Actuarial Asset Valuation Method (AAVM) is used to determine the Actuarial Value of Assets (AVA) of the Plan.

The Actuary reset the AVA to the market value as of June 30, 2019. Beginning with the June 30, 2020 (Lag) actuarial valuation, the AAVM recognizes investment returns greater or less than expected over a period of five years. In accordance with this AAVM, the Unexpected Investment Returns (UIR) are phased into the AVA over a five-year period at 20% per year. UIR is defined as the excess of net investment return over the Expected Investment Return (EIR) based on the Market Value of Assets (MVA).

Beginning with the June 30, 2018 (Lag) actuarial valuation, the Actuarial Value of Assets is determined by re-characterizing the interest credited on TDA Fixed Fund account balances as investment income instead of as a cash disbursement.

The AVA is further constrained to be within a corridor of 80% to 120% of the market value.

Table II-1
Statement of Plan Net Assets

(\$ Thousands)		
	June 30, 2019	June 30, 2018
ASSETS		
Cash	\$ 3,694	\$ 2,106
Receivables		
Investment Securities Sold	\$ 173,665	\$ 84,962
Member Loans	50,586	50,038
Accrued Interest and Dividends	15,501	13,273
Other	626	794
Total Receivables	\$ 240,378	\$ 149,067
INVESTMENTS AT FAIR VALUE		
Fixed return funds		
Short-Term Investments		
Commercial Paper	\$ 46,954	\$ 69,031
Short-term Investment Fund	26,625	56,088
Discount Notes	11,108	9,331
Debt Securities	1,841,703	1,531,460
Equity Securities	2,116,377	1,687,635
Alternative Investments	892,479	765,549
Collective Trust Funds		
Fixed Income	123,051	256,554
Domestic Equity	261,858	152,372
International Equity	1,096,779	1,167,563
Mortgage Debt Security	20,203	34,966
Treasury Inflation Protected Securities	0	283,241
Collateral From Securities Lending	411,646	389,554
Variable return funds		
Short-Term Investments	467	495
Debt Securities	1,095	1,076
Equities	53,088	51,828
Collateral From Securities Lending	359	586
Total Investments	\$ 6,903,792	\$ 6,457,329
TDA Program's interest in the fixed return fund	0	0
OTHER ASSETS	248,466	206,757
TOTAL ASSETS	\$ 7,396,330	\$ 6,815,259
LIABILITIES		
Accounts Payable	\$ 43,333	\$ 34,454
Payable for Investment Securities Purchased	182,667	115,140
Accrued Benefits Payable	10,034	9,747
TDA Program's interest in the fixed return fund	1,756,459	1,592,875
Security Lending	412,005	390,140
TOTAL LIABILITIES	\$ 2,404,498	\$ 2,142,356
PLAN ASSETS HELD IN TRUST FOR PENSION BENEFITS	\$ 4,991,832	\$ 4,672,903

Table II-2
Statement of Changes in Plan Net Assets

(\$ Thousands)		
	June 30, 2019	June 30, 2018
ADDITIONS		
Contributions		
Member Contributions	\$ 46,304	\$ 40,846
Employer Contributions	<u>269,637</u>	<u>318,643</u>
Total Contributions	\$ 315,941	\$ 359,489
Investment Income (Loss)		
Interest Income	\$ 85,249	\$ 75,362
Dividend Income	82,451	79,629
Net Appreciation (Depreciation) in Fair Value	<u>268,479</u>	<u>426,315</u>
Total Investment Income (Loss)	\$ 436,179	\$ 581,306
Less Investment Expenses	31,220	19,429
Net Income (Loss)	\$ 404,959	\$ 561,877
Securities Lending Transactions		
Securities Lending Income	\$ 2,124	\$ 3,995
Securities Lending Fees	<u>(204)</u>	<u>(295)</u>
Net Securities Lending Income (Loss)	\$ 1,920	\$ 3,700
Net Investment Income (Loss)	\$ 406,879	\$ 565,577
Other		
Payments to Other Retirement Systems & Other Revenues/Expenses	\$ 35,624	\$ 51,024
TDA Program's Interest Income in the Fixed Return Fund	<u>\$ (141,695)</u>	<u>\$ (127,972)</u>
TOTAL ADDITIONS	\$ 616,749	\$ 848,118
DEDUCTIONS		
Benefit Payments and Withdrawals	\$ 280,463	\$ 261,574
Administrative Expenses	<u>17,357</u>	<u>13,212</u>
TOTAL DEDUCTIONS	\$ 297,820	\$ 274,786
NET INCREASE (DECREASE) IN PLAN NET ASSETS	\$ 318,929	\$ 573,332
PLAN NET ASSETS HELD IN TRUST FOR PENSION BENEFITS		
Beginning of Year	\$ 4,672,903	\$ 4,099,571
End of Year	\$ 4,991,832	\$ 4,672,903

Table II-3
Development of Actuarial Value of Assets

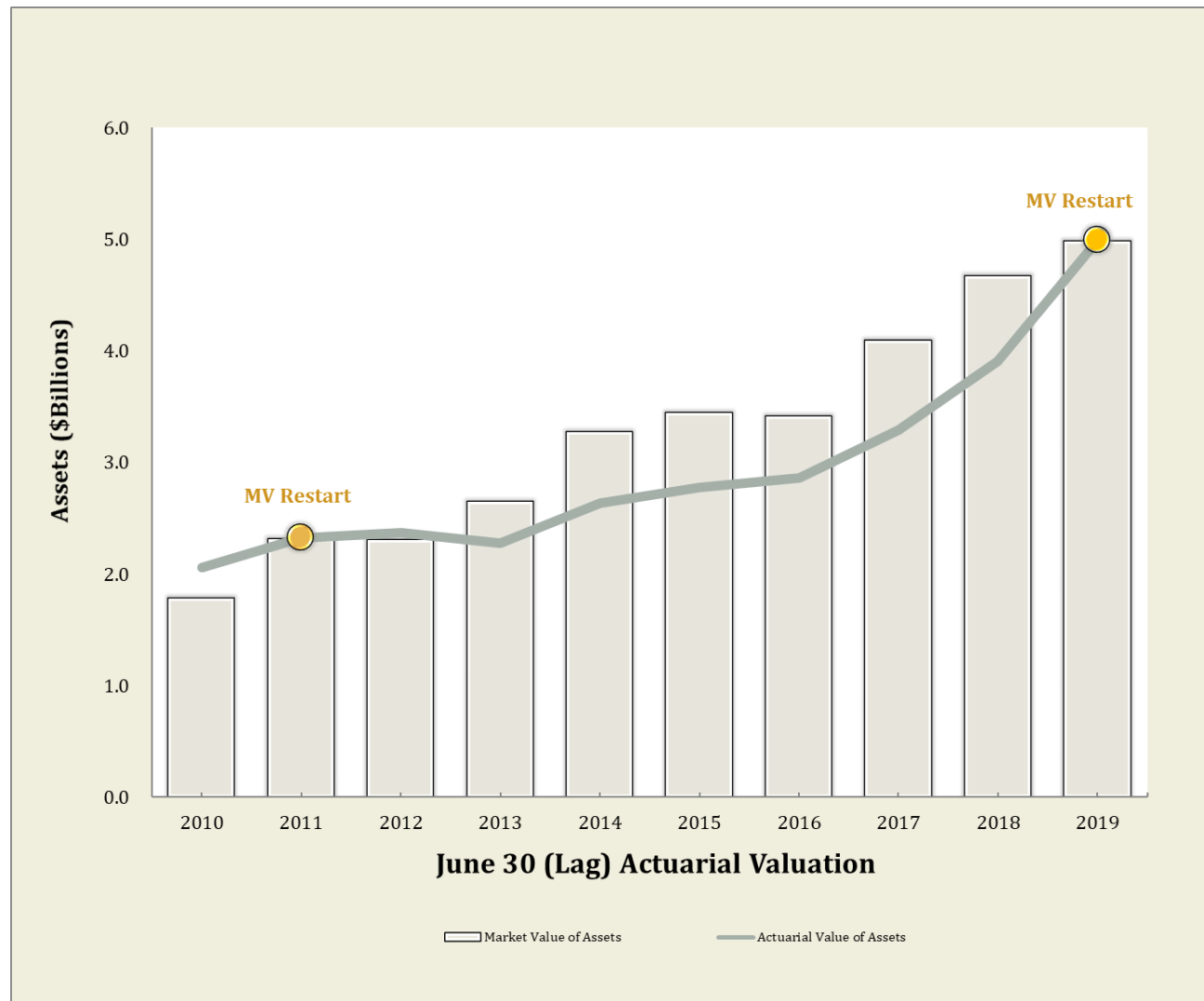
(\$ Thousands)		
Valuation Date	June 30, 2019 ¹	June 30, 2018
Fixed Fund		
Market Value of Assets (MVA)		
Beginning of Year (BOY)	\$ 4,619,409	\$ 4,051,902
End of Year (EOY)	\$ 4,937,065	\$ 4,619,409
1. Contributions		
a. Employee	\$ 46,304	\$ 40,846
b. Employer	<u>269,637</u>	<u>318,643</u>
c. Total Contributions	\$ 315,941	\$ 359,489
2. Net Investment Income		
a. Investment Income	\$ 292,495	\$ 451,130
b. Investment Expenses	<u>(31,170)</u>	<u>(19,384)</u>
c. Total Net Investment Income	\$ 261,325	\$ 431,746
3. Cash Flow (Other)	\$ (259,610)	\$ (223,728)
4. Net Cash Flow (1.c. + 3.)	\$ 56,331	\$ 135,761
5. Average invested assets		
a. AVA @ BOY	N/A	\$ 3,241,522
b. 1/2 Net Cash Flow ((1.c. + 3.) / 2)	N/A	<u>67,881</u>
c. Total	N/A	\$ 3,309,403
6. Expected Rate of Return (AIR)	7.00%	7.00%
7. Expected Investment Return (EIR) ²	\$ 261,325	\$ 231,658
8. Unexpected Investment Return (UIR) (2.c. - 7.)	\$ 0	\$ 200,088
9. AVA @ EOY		
a. AVA @ BOY (prior to corridor limit) ²	N/A	\$ 3,119,041
b. Net Cash Flow (4.)	N/A	135,761
c. Expected Investment Return (7.)	N/A	231,658
d. Phase in of UIR ³		
20% / 15% * UIR for prior year	N/A	30,013
20% / 15% * UIR for second prior year	N/A	99,585
20% / 15% * UIR for third prior year	N/A	(2,932)
20% / 15% * UIR for fourth prior year	N/A	(1,161)
20% / 20% * UIR for fifth prior year	N/A	143,114
0% / 20% * UIR for sixth prior year	N/A	<u>100,260</u>
Total	N/A	\$ 368,879
e. Preliminary AVA (9.a. + 9.b. + 9.c. + 9.d.)	N/A	\$ 3,855,339
10. Corridor		
a. 80% of MVA	\$ 3,949,652	\$ 3,695,528
b. 120% of MVA	\$ 5,924,478	\$ 5,543,290
11. Final AVA @ EOY	\$ 4,937,065	\$ 3,855,339
12. Variable Assets	\$ 54,767	\$ 53,494
13. Total AVA @ EOY (11. + 12.)	\$ 4,991,832	\$ 3,908,833

¹ Calculations reflect the "Revised 2021 A&M," the actuarial assumptions and methods proposed in a memo dated July 16, 2021 and adopted by the Board of Trustees at the September 23, 2021 meeting.

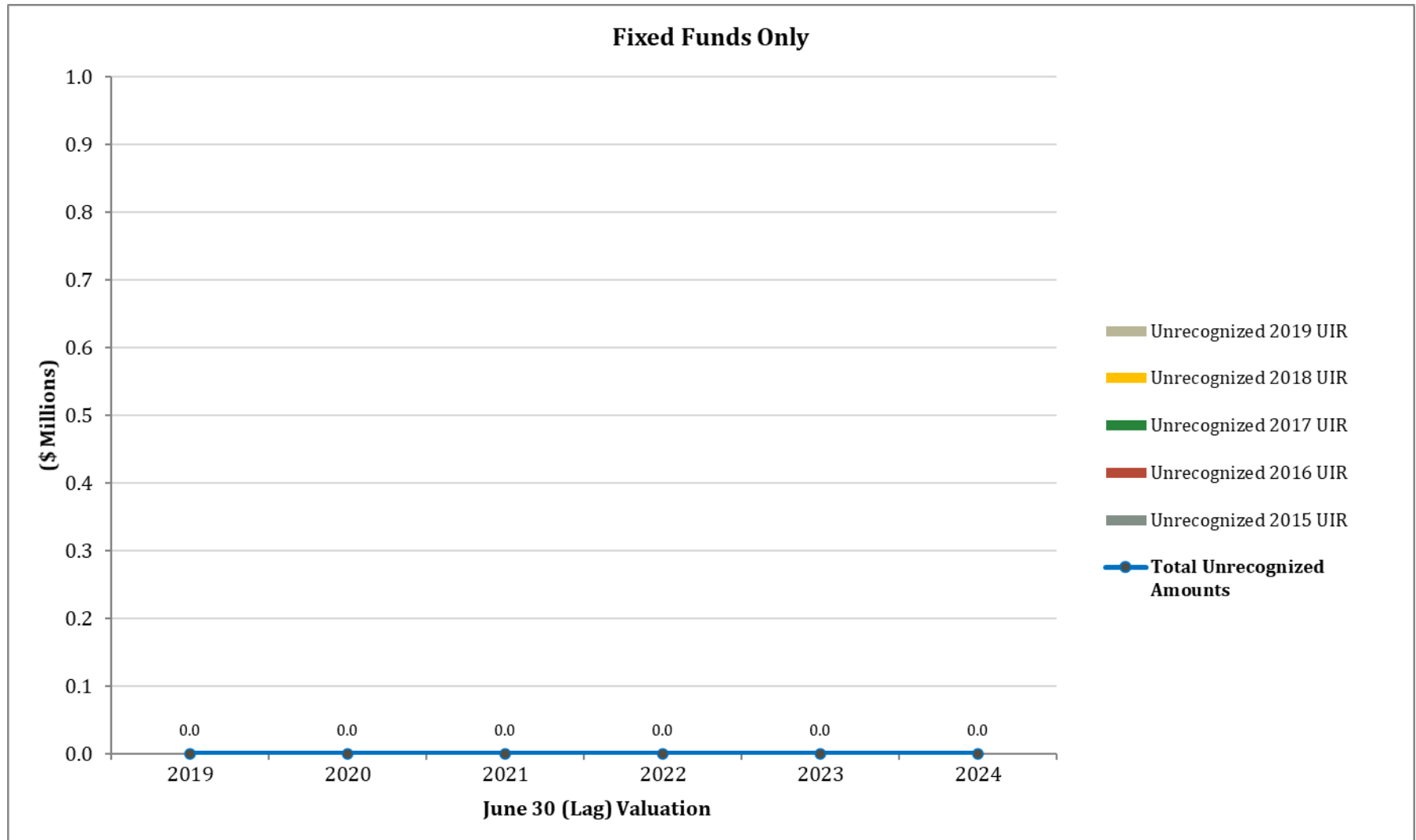
² Due to the "Revised 2021 A&M," the AVA has been restarted by setting it equal to the MVA and actual rather than expected investment return is used for the June 30, 2019 calculations.

³ Due to the "Revised 2021 A&M," the recognition of UIR is changed from the prior six-year period at 15% for the first four years and 20% for the next two years to a five-year period at 20% per year.

Graph II-4
Historical Market and Actuarial Value of Assets



Graph II-5
Future Recognition of UIR as of June 30, 2019



As a result of the AVA restart as of June 30, 2019, all previous UIRs have been recognized.

SECTION III - CONTRIBUTION DEVELOPMENT AND HISTORY

Table III-1
Statutory Contributions

Table III-1 shows the components of the Fiscal Year 2021 and the Fiscal Year 2020 Statutory Contributions.

COMPONENTS OF CURRENT AND PRIOR FISCAL YEAR STATUTORY CONTRIBUTIONS		
Valuation Date	June 30, 2019 (Lag)	June 30, 2018 (Lag)
Fiscal Year	2021	2020
Normal Cost ¹	\$ 145,648,691	\$ 139,073,924
Amortization of Unfunded Accrued Liability		
-Initial UAL	128,622,398	124,876,115
-2011 (Gain)/Loss	(21,558,572)	(21,558,572)
-2012 (Gain)/Loss	4,365,823	4,365,823
-2013 (Gain)/Loss	38,526,274	38,526,274
-2014 (Gain)/Loss	9,952,844	9,952,845
-2014 Assumption Changes ²	16,568,028	16,568,028
-2014 Method Changes ³	(27,567,113)	(27,567,113)
-2015 (Gain)/Loss	15,178,241	15,178,241
-2016 (Gain)/Loss	12,812,358	12,812,358
-2017 (Gain)/Loss	(39,483,349)	(39,483,349)
-2017 Assumption Changes ⁴	(22,230,444)	(22,230,444)
-2017 Method Changes ⁴	11,007,581	11,007,581
-2018 (Gain)/Loss	(7,877,140)	(7,877,140)
-2018 Method Change ⁵	(11,267,543)	(11,267,543)
-2019 (Gain)/Loss	(38,601,844)	NA
-2019 Assumption Change ⁶	(2,255,653)	NA
-2019 Method Change ⁶	(48,729,573)	NA
Total	17,462,316	103,303,104
Administrative Expenses	19,872,029	15,126,419
Late Contribution Interest	48	0
Total Contribution to the New York City Board of Education Retirement System	\$ 182,983,084	\$ 257,503,447

¹ Includes amounts necessary, if any, to provide for financing of the Excess Benefit Plan established by Chapter 623/04, but not yet formally adopted by the Board of Trustees.

² Change in post-retirement mortality assumptions including the change to the mortality improvement scale MP-2015.

³ AVA is constrained to a corridor of 80% to 120% of the market value.

⁴ 2019 A&M.

⁵ Change in method of characterizing interest credited on TDA Fixed Fund account balances.

⁶ Revised 2021 A&M.

Table III-2
Schedule of Unfunded Accrued Liability Bases

The Initial Unfunded Accrued Liability (UAL) is being amortized over a closed 22-year period using Increasing Dollar Payments (IDP). Under IDP, amortization payments increase by 3.0% per year, consistent with the assumed rate of General Wage Increases. Increments to the UAL established after June 30, 2010 are generally amortized using Level Dollar Payments (LDP) as follows:

- Benefit Changes – Over the remaining working lifetimes of those impacted, unless the amortization period is determined by statute.
- Assumption and Method Changes – Over a closed 20-year period.
- Actuarial Gains and Losses – Over a closed 15-year period.

Under the One-Year Lag methodology (OYLM), the number of payments is one fewer than the number of years in the amortization period (e.g. 14 payments over a closed 15-year amortization period).

Table III-2
Schedule of Unfunded Accrued Liability Bases (cont'd)

Table III-2 shows the Schedule of UAL Bases as of June 30, 2019.

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM SCHEDULE OF UNFUNDED ACCRUED LIABILITY BASES						
Amortization Base	Date Established	Original Amount	Amortization Years	Amortization Payment	Payments Remaining	OYLM UAL June 30, 2019
Initial UAL	6/30/10	\$ 1,312,067,636	22	\$ 128,622,398	12	\$ 1,140,685,267
(Gain)/Loss	6/30/11	\$ (182,268,307)	15	\$ (21,558,572)	6	\$ (99,341,638)
(Gain)/Loss	6/30/12	\$ 36,911,124	15	\$ 4,365,823	7	\$ 22,746,036
(Gain)/Loss	6/30/13	\$ 325,722,811	15	\$ 38,526,274	8	\$ 222,399,549
(Gain)/Loss	6/30/14	\$ 84,146,947	15	\$ 9,952,844	9	\$ 62,688,116
Assumption Change ¹	6/30/14	\$ 165,544,370	20	\$ 16,568,028	14	\$ 140,075,433
Asset Method Change ²	6/30/14	\$ (275,445,000)	20	\$ (27,567,113)	14	\$ (233,067,895)
(Gain)/Loss	6/30/15	\$ 128,325,391	15	\$ 15,178,241	10	\$ 103,059,533
(Gain)/Loss	6/30/16	\$ 108,322,889	15	\$ 12,812,358	11	\$ 92,879,885
(Gain)/Loss	6/30/17	\$ (333,814,462)	15	\$ (39,483,349)	12	\$ (303,172,289)
Assumption Change ³	6/30/17	\$ (222,122,082)	20	\$ (22,230,444)	17	\$ (209,821,240)
Method Changes ³	6/30/17	\$ 109,985,516	20	\$ 11,007,581	17	\$ 103,894,657
(Gain)/Loss	6/30/18	\$ (66,597,775)	15	\$ (7,877,140)	13	\$ (63,644,500)
Method Change ⁴	6/30/18	\$ (112,583,000)	20	\$ (11,267,543)	18	\$ (109,571,066)
(Gain)/Loss	6/30/19	\$ (326,361,725)	15	\$ (38,601,844)	14	\$ (326,361,725)
Assumption Change ⁵	6/30/19	\$ (22,538,024)	20	\$ (2,255,653)	19	\$ (22,538,024)
Asset Method Change ⁵	6/30/19	\$ (486,896,000)	20	\$ (48,729,573)	19	\$ (486,896,000)

¹ Change in post-retirement mortality assumptions including the change to the mortality improvement scale MP-2015.

² AVA is constrained to a corridor of 80% to 120% of the market value.

³ 2019 A&M.

⁴ Change in method of characterizing interest credited on TDA Fixed Fund account balances.

⁵ Revised 2021 A&M.

Graph III-3
Remaining UAL Amortizations as of June 30, 2019

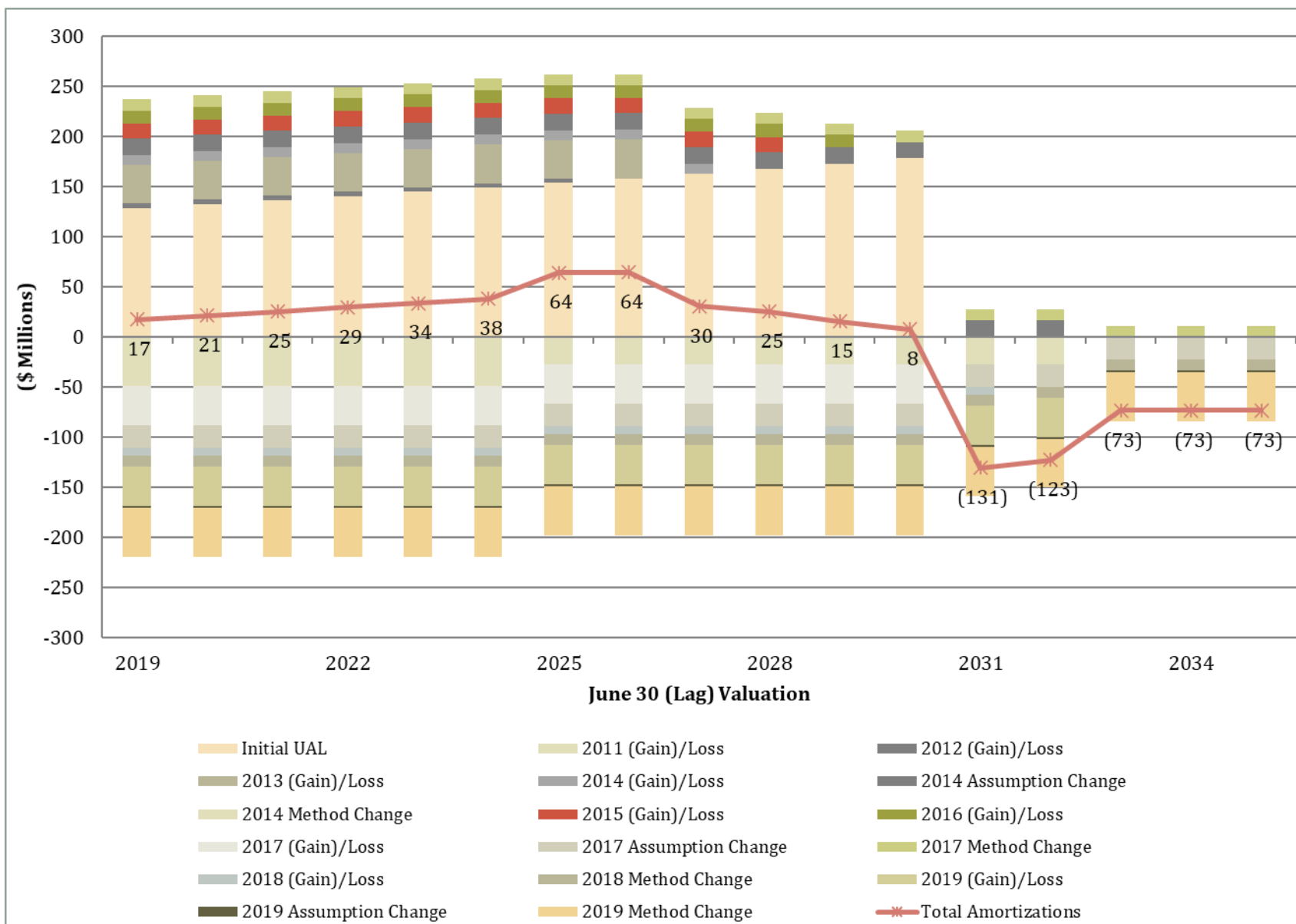


Table III-4
Reconciliation of Outstanding UAL Bases

	Amounts (\$ Thousands) Remaining to be Amortized, as of									
June 30 (Lag) Valuation Date	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unfunded Accrued Liability, June 30, 2010	\$ 1,312,068	\$ 1,403,912	\$ 1,400,216	\$ 1,393,202	\$ 1,382,546	\$ 1,367,898	\$ 1,348,883	\$ 1,211,301	\$ 1,178,886	\$ 1,140,685
2011 (Gain)/Loss		(182,268)	(195,027)	(186,379)	(177,125)	(167,223)	(156,628)	(124,451)	\$ (112,321)	\$ (99,342)
ERI		148	159	123	85	44	0	0	0	0
2012 (Gain)/Loss			36,911	39,495	37,744	35,870	33,864	27,498	25,202	22,746
2013 (Gain)/Loss				325,723	348,523	333,068	316,531	261,591	242,658	222,400
2014 (Gain)/Loss					84,147	90,038	86,044	72,150	67,579	62,688
2014 Assumption Changes					165,544	177,132	172,394	151,306	145,881	140,075
2014 Asset Method Change					(275,445)	(294,726)	(286,841)	(251,754)	(242,727)	(233,068)
2015 (Gain)/Loss						128,325	137,308	116,546	110,031	103,060
2016 (Gain)/Loss							108,323	103,519	98,379	92,880
2017 (Gain)/Loss								(333,814)	(319,011)	(303,172)
2017 Assumption Changes								(222,122)	(216,180)	(209,821)
2017 Method Change								109,986	107,043	103,895
2018 (Gain)/Loss									(66,598)	(63,645)
2018 Asset Method Change									(112,583)	(109,571)
2019 (Gain)/Loss										(326,362)
2019 Assumption Changes										(22,538)
2019 Asset Method Change										(486,896)
Sum of Outstanding Amortization Amounts	\$ 1,312,068	\$ 1,221,792	\$ 1,242,259	\$ 1,572,164	\$ 1,566,019	\$ 1,670,426	\$ 1,759,878	\$ 1,121,756	\$ 906,240	\$ 34,014

June 30 (Lag) Valuation Date	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1. Accrued Liability (AL)	\$ 3,558,251	\$ 3,681,694	\$ 3,763,130	\$ 4,015,080	\$ 4,335,746	\$ 4,585,781	\$ 4,767,760	\$ 4,743,881	\$ 5,103,583	\$ 5,306,986
2. Actuarial Value of Assets (AVA)	2,056,452	2,323,629	2,371,613	2,277,791	2,632,922	2,772,466	2,858,737	3,289,191	3,908,833	4,991,832
3. Due To/From TDA	15,533	15,830	27,915	32,966	1,982	1,773	2,005	8,871	14,176	14,248
4. Unfunded Accrued Liability (UAL) (1. - 2. - 3.)	1,486,266	1,342,235	1,363,602	1,704,323	1,700,842	1,811,542	1,907,018	1,445,819	1,180,574	300,906
5. PV 1-year Adjusted Employer Contribution	174,198	102,338	102,516	113,311	114,830	118,963	121,755	293,857	243,527	234,315
6. PV Future Administrative Expense Reimbursement	0	18,105	18,828	18,849	19,993	22,153	25,385	30,206	30,807	32,577
7. Adjusted UAL (4. - 5. - 6.)	\$ 1,312,068	\$ 1,221,792	\$ 1,242,258	\$ 1,572,163	\$ 1,566,019	\$ 1,670,426	\$ 1,759,878	\$ 1,121,756	\$ 906,240	\$ 34,014

Table III-5
Actuarial and Statutory Contribution History

Table III-5 compares the Statutory Contributions to the Actuarial Contributions for Fiscal Years 2012 through 2021.

(\$ Thousands)			
Fiscal Year Ended June 30	Actuarial Contribution Certified	Statutory Contribution Contributed	Percentage of Actuarial Contribution Contributed
2012	213,651	213,651	100.0%
2013	196,246	196,246	100.0%
2014	214,590	214,590	100.0%
2015	258,099	258,099	100.0%
2016	265,532	265,532	100.0%
2017	288,233	288,233	100.0%
2018	318,643	318,643	100.0%
2019	269,637	269,637	100.0%
2020	257,503	257,503	100.0%
2021	182,983	182,983	100.0%

Table III-6
City Rates: Contributions as a Percentage of Salary

Table III-6 shows the City Rates defined to be the contributions as a percentage of salary for the Fiscal Years 2012 through 2021.

CITY RATES (\$ Thousands)			
Fiscal Year Ended June 30	Actuarial Contribution	Salary¹ at Beginning of Fiscal Year	City Rate
2012	213,651	879,472	24.3%
2013	196,246	886,178	22.1%
2014	214,590	989,160	21.7%
2015	258,099	1,016,822	25.4%
2016	265,532	1,008,056	26.3%
2017	288,233	1,052,171	27.4%
2018	318,643	1,102,184	28.9%
2019	269,637	1,180,855	22.8%
2020	257,503	1,258,395	20.5%
2021	182,983	1,330,996	13.7%

¹Includes the impact of recent labor contract settlements and certain non-union salary increases with retroactive effective dates, if any.

SECTION IV – RESULTS BY CONTRIBUTING ENTITY

Table IV-1
Employer Contributions by Obligor

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM						
EMPLOYER CONTRIBUTION BY OBLIGOR						
Valuation Date	June 30, 2019 (Lag)					
Fiscal Year	2021					
Obligor	Department of Education	NYC School Construction Authority	Renaissance Charter School	KIPP Charter School	Charter School Subtotal	Total
Contribution						
1. Normal Cost	\$ 138,908,973	\$ 6,676,990	\$ 62,728	\$ 0	\$ 62,728	\$ 145,648,691
2. Amortization of Unfunded Accrued Liability	16,266,601	1,139,067	47,794	8,854	56,648	17,462,316
3. Administrative Expenses	18,734,812	1,128,548	8,669	0	8,669	19,872,029
4. Late Contributon Interest	0	0	0	48	48	48
5. Actuarial Contribution (1. + 2. + 3. + 4.)	\$ 173,910,386	\$ 8,944,605	\$ 119,191	\$ 8,902	\$ 128,093	\$ 182,983,084
6. Statutory Contribution (5.)	\$ 173,910,386	\$ 8,944,605	\$ 119,191	\$ 8,902	\$ 128,093	\$ 182,983,084

Table IV-2
Accrued Liabilities by Obligor

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM						
SUMMARY OF LIABILITY BY STATUS AND OBLIGOR						
Valuation Date	June 30, 2019 (Lag)					
Fiscal Year	2021					
Obligor	Department of Education	NYC School Construction Authority	Renaissance Charter School	KIPP Charter School	Charter School Subtotal	Total
Accrued Liability						
1. Active Members	\$ 2,296,607,744	\$ 151,249,013	\$ 1,183,774	\$ 0	\$ 1,183,774	\$ 2,449,040,531
2. Active Off Payroll Members ¹	94,746,300	2,376,509	15,276	65,286	80,562	97,203,371
3. Terminated Vested Members	76,717,092	2,847,199	0	27,704	27,704	79,591,995
4. Retirees and Beneficiaries	<u>2,577,201,469</u>	<u>102,407,031</u>	<u>541,453</u>	<u>0</u>	<u>541,453</u>	<u>2,680,149,953</u>
5. Accrued Liability Pre-Adjustments (1. to 4.)	\$ 5,045,272,605	\$ 258,879,752	\$ 1,740,503	\$ 92,990	\$ 1,833,493	\$ 5,305,985,850
6. Actuarial Adjustments ²	<u>981,002</u>	<u>18,998</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1,000,000</u>
7. Total Accrued Liability (AL) (5. + 6.)	\$ 5,046,253,607	\$ 258,898,750	\$ 1,740,503	\$ 92,990	\$ 1,833,493	\$ 5,306,985,850
Present Value of Benefits						
1. Active Members	\$ 3,792,602,436	\$ 229,620,769	\$ 1,834,731	\$ 0	\$ 1,834,731	\$ 4,024,057,936
2. Active Off Payroll Members ¹	94,746,300	2,376,509	15,276	65,286	80,562	97,203,371
3. Terminated Vested Members	76,717,092	2,847,199	0	27,704	27,704	79,591,995
4. Retirees and Beneficiaries	<u>2,577,201,469</u>	<u>102,407,031</u>	<u>541,453</u>	<u>0</u>	<u>541,453</u>	<u>2,680,149,953</u>
5. Present Value of Benefits (1. to 4.)	\$ 6,541,267,297	\$ 337,251,508	\$ 2,391,460	\$ 92,990	\$ 2,484,450	\$ 6,881,003,255
6. Actuarial Adjustments ²	<u>981,002</u>	<u>18,998</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1,000,000</u>
7. Total Present Value of Benefits (5. + 6.)	\$ 6,542,248,299	\$ 337,270,506	\$ 2,391,460	\$ 92,990	\$ 2,484,450	\$ 6,882,003,255

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

² Includes actuarial loading adjustments.

Table IV-3
Participant Data by Obligor

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM						
PARTICIPANT DATA BY OBLIGOR						
Valuation Date	June 30, 2019 (Lag)					
Fiscal Year	2021					
Obligor	Department of Education	NYC School Construction Authority	Renaissance Charter School	KIPP Charter School	Charter School Subtotal	Total
Participant Data						
1. Active Members						
a. Number	25,106	705	14	0	14	25,825
b. Annual Salary ¹	\$ 1,275,823,048	\$ 76,852,992	\$ 590,315	\$ 0	\$ 590,315	\$ 1,353,266,355
c. Average Salary	\$ 50,817	\$ 109,011	\$ 42,165	\$ 0	\$ 42,165	\$ 52,401
2. Active Off Payroll Members ²	11,335	81	1	5	6	11,422
3. Terminated Vested Members	1,987	31	0	1	1	2,019
4. Retirees and Beneficiaries						
a. Number	18,198	300	4	0	4	18,502
b. Total Annual Benefits	\$ 257,204,775	\$ 9,906,440	\$ 50,618	\$ 0	\$ 50,618	\$ 267,161,833
c. Average Annual Benefit	\$ 14,134	\$ 33,021	\$ 12,655	\$ 0	\$ 12,655	\$ 14,440

¹ Salaries shown reflect the impact of recent labor contract settlements and certain non-union salary increases with retroactive effective dates, if any.

² Represents members no longer on payroll, but not otherwise classified.

SECTION V - (GAIN)/LOSS ANALYSIS

Table V-1
Development of Experience (Gain)/Loss

Table V-1 develops the asset and liability (Gain)/Loss between the June 30, 2018 (Lag) actuarial valuation and the June 30, 2019 (Lag) actuarial valuation.

DEVELOPMENT OF EXPERIENCE (GAIN) / LOSS June 30, 2019 (\$ Thousands)	
1. Expected Accrued Liability (AL)	
a. AL at June 30, 2018	\$ 5,103,583
b. Total Normal Cost and Administrative Expenses at June 30, 2018	187,197
c. Interest on 1.a. and 1.b. to June 30, 2019	370,355
d. Fiscal Year 2019 Benefit Payments	(280,463)
e. Interest on 1.d. to June 30, 2019	<u>(9,650)</u>
f. Expected AL at June 30, 2019	\$ 5,371,022
2. Actual AL at June 30, 2019 (before changes, if any)	\$ 5,329,488
3. Expected Total Actuarial Value of Assets (AVA) ¹	
a. Total at June 30, 2018	\$ 3,923,009
b. Interest on 3.a. to June 30, 2019	274,611
c. Total Contributions Paid in Fiscal Year 2019	315,941
d. Interest on 3.c. to June 30, 2019	10,871
e. Fiscal Year 2019 Benefit Payments (1.d.)	(280,463)
f. Interest on 3.e. to June 30, 2019 (1.e.)	<u>(9,650)</u>
g. Expected Total at June 30, 2019	\$ 4,234,319
4. Actual Total AVA at June 30, 2019 (before changes, if any) ²	\$ 4,519,147
5. Accrued Liability (Gain) / Loss (2. - 1.e.)	\$ (41,534)
6. Actuarial Asset (Gain) / Loss (3.f. - 4.)	\$ (284,828)
7. Total Actuarial (Gain) / Loss (5. + 6.)	\$ (326,362)

¹ Includes amount due from TDA of \$14,176,000.

² Includes amount due from TDA of \$14,211,000.

SECTION VI – SCHEDULE OF FUNDING PROGRESS

A schedule of funding progress is provided below. This schedule of funding progress was previously required by GASB 25, which has been superseded by GASB 67, and is provided for historical context. These liability and asset measures are used to develop the Actuarial Contribution and are not suitable for other purposes including, but not limited to, settlement of plan obligations. For more information, see SECTION II – MARKET AND ACTUARIAL VALUES OF ASSETS.

Table VI-1
Schedule of Funding Progress

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM (\$ Thousands)						
June 30 (Lag) Valuation Date	(1) Actuarial Value of Assets (AVA)	(2) Accrued Liability (AL)	(3) Unfunded AL (UAL) (2) - (1)	(4) Funded Ratio (1) / (2)	(5) Covered Payroll	(6) UAL as a % of Covered Payroll (3) / (5)
2010	2,056,452	3,558,251	1,501,799	57.8%	912,290	164.6%
2011	2,323,629	3,681,694	1,358,065	63.1%	920,369	147.6%
2012	2,371,613	3,763,130	1,391,517	63.0%	1,018,895	136.6%
2013	2,277,791	4,015,080	1,737,289	56.7%	1,051,571	165.2%
2014	2,632,922	4,335,746	1,702,824	60.7%	1,045,188	162.9%
2015	2,772,466	4,585,781	1,813,315	60.5%	1,093,962	165.8%
2016	2,858,737	4,767,760	1,909,023	60.0%	1,149,020	166.1%
2017	3,289,191	4,743,881	1,454,690	69.3%	1,201,926	121.0%
2018	3,908,833	5,103,583	1,194,750	76.6%	1,280,302	93.3%
2019	4,991,832	5,306,986	315,154	94.1%	1,353,266	23.3%

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

SECTION VII - RISK AND UNCERTAINTY

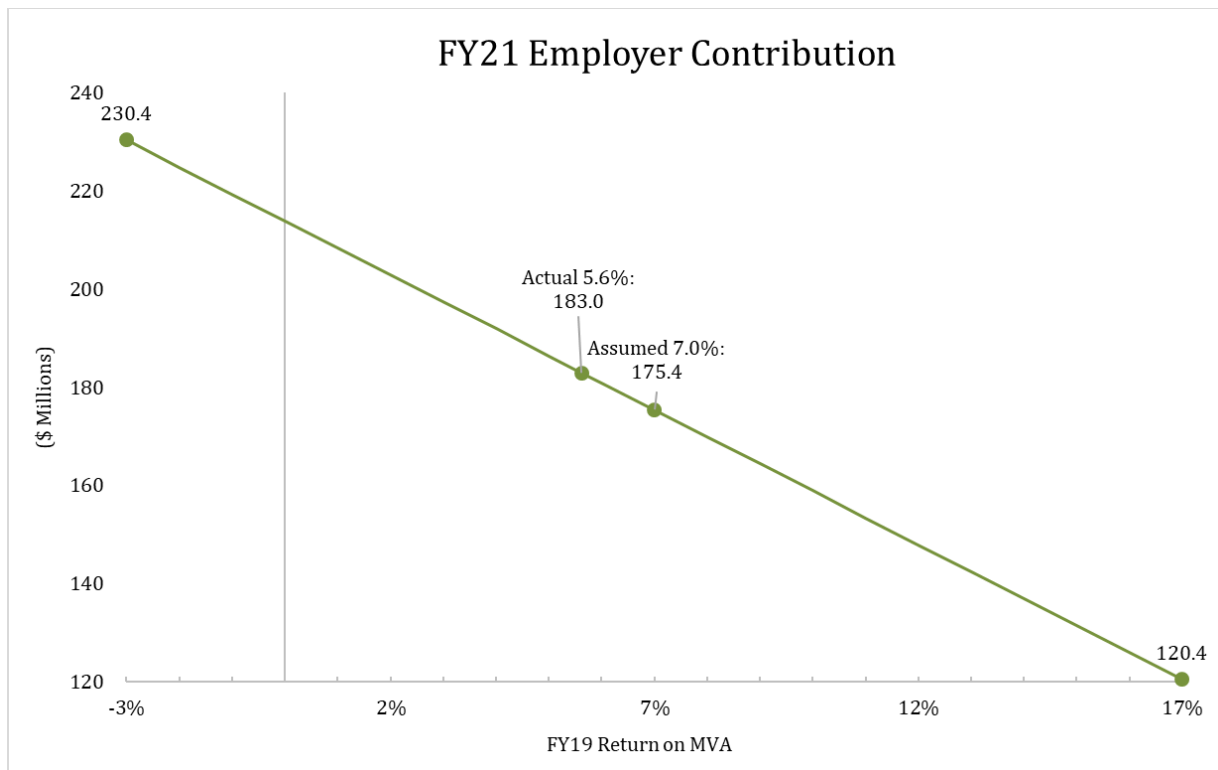
The funded status of BERS depends highly on the realization of the actuarial assumptions used, as well as certain demographic characteristics of the Plan and other exogenous factors. Risks faced by the Plan are described in this Section. These risks have been separated, based on the Actuary's professional judgement, into high, medium, and other risks.

High Risk Types

Investment Risk: The Risk of Not Realizing Expected Returns

The most substantial risk for most pension systems, BERS included, is the risk of investment returns being less than assumed. Generally speaking, as risk-free investment return rates have fallen in recent decades, more aggressive asset allocations have been taken to achieve long-term rates of return commensurate with the actuarial assumption of 7.0%.

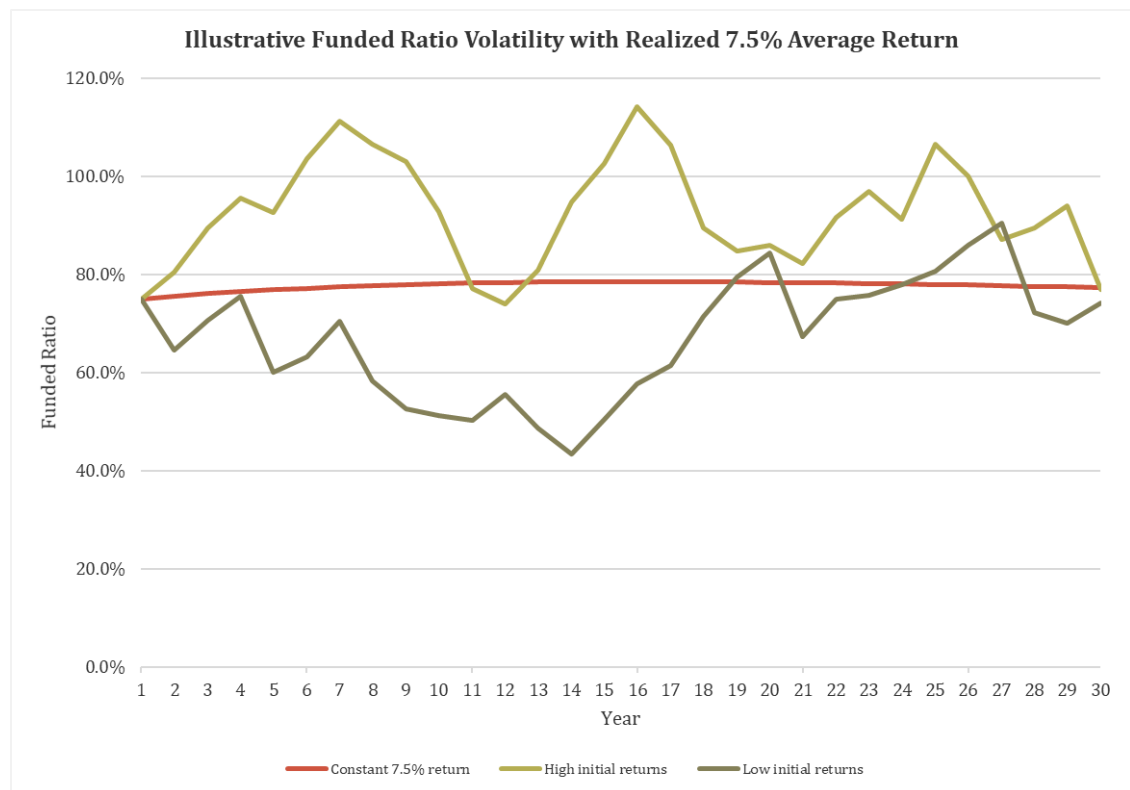
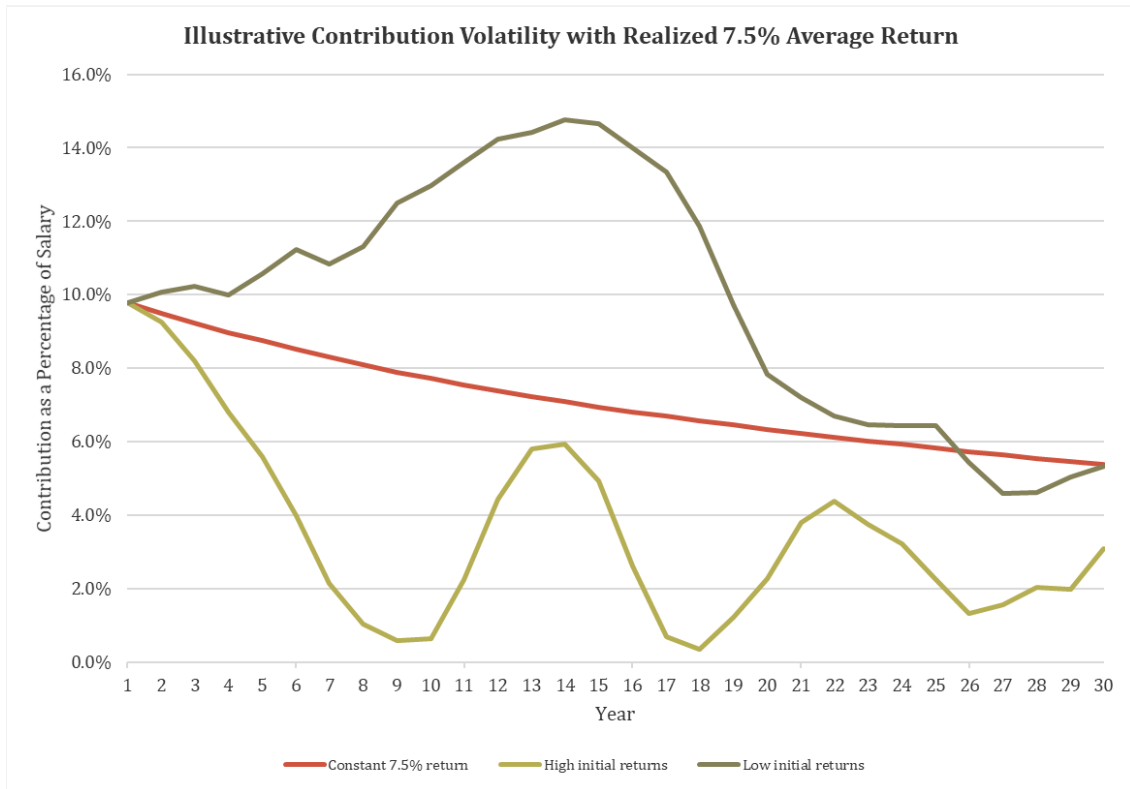
The graph below illustrates the potential FY21 employer contributions if the annual investment return had differed from the actual rate, by up to 10%.



Investment Risk: The Risk of Volatile Realized Returns

Even when long-term investment returns meet actuarial assumptions, investment return volatility can contribute substantially to contribution and funded status volatility. While not yet available specifically for the Plan at this time, recent research demonstrates this volatility based on a sample public plan with typical characteristics, a typical contribution policy, and a long-term return assumption of 7.5%, which can be realized in different patterns.¹

¹ Yin, Yimeng; Boyd, Don. Pension Simulation Project. *The Nelson A. Rockefeller Institute of Government*.



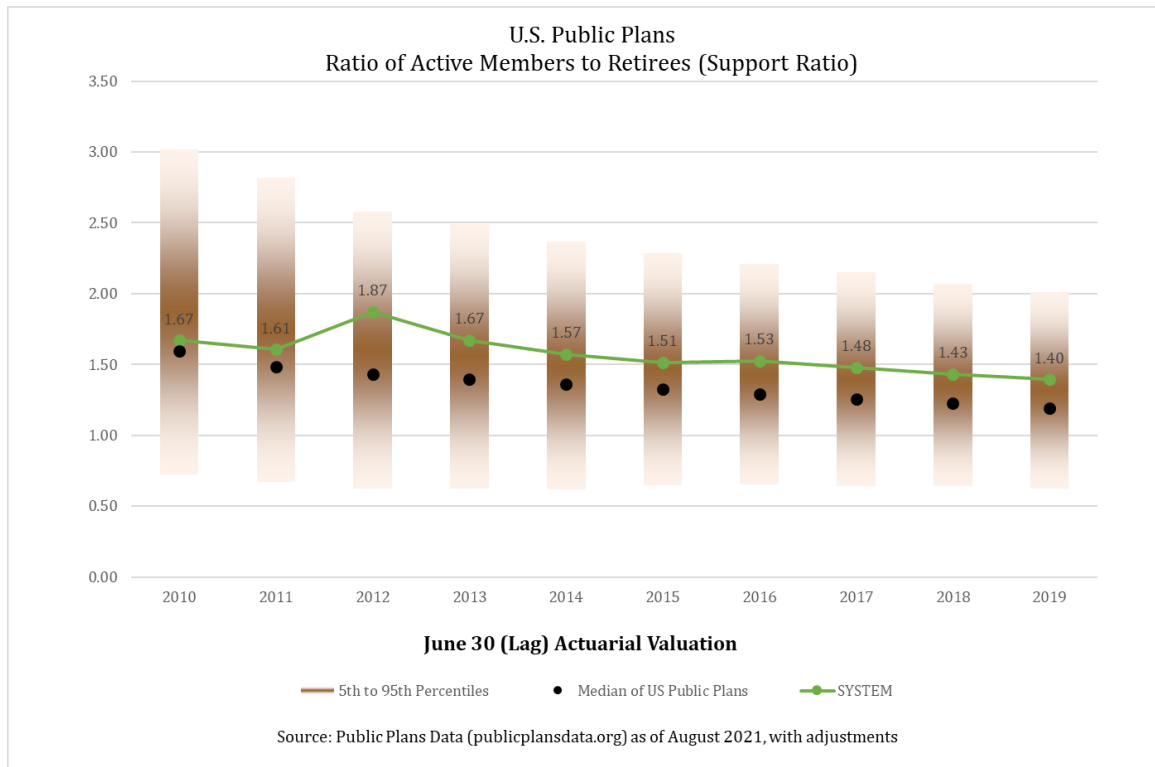
Medium Risk Types

Maturity Risk: The Risk of Demographic Imbalance

In this subsection, the maturity of the Plan is examined with several metrics.

Ratio of Active Members to Retirees (Support Ratio)

A plan's Support Ratio (i.e. the ratio of active members to retirees) is an indicator of the Plan's maturity level. In a plan's early years, the ratio is very high as the plan contains mostly active members. As it matures, more active members transition to retirement, leading to a decrease in the Support Ratio over time that can result in a ratio near or below one. For BERS, this ratio has been steadily declining in recent years, meaning that fewer active workers exist to support guaranteed pensioner payments.

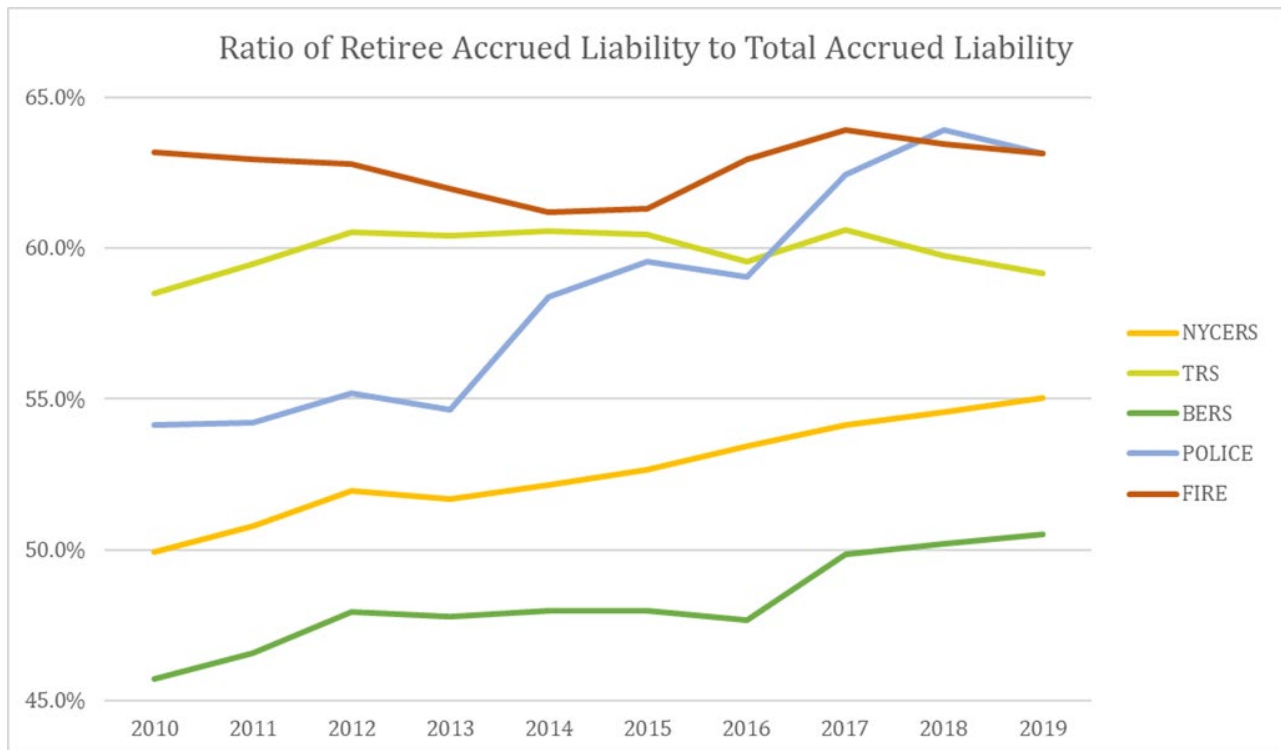


The chart above shows U.S. public pension plan Support Ratios in comparison to the Plan's. The median Support Ratio amongst US public pensions has declined from 1.60 in the 2010 valuation year to 1.19 in the 2019 valuation year. Over that same period, the Plan's Support Ratio declined from 1.67 to 1.40, meaning fewer active workers exist to support guaranteed pensioner payments.

Because the Plan's Support Ratio is above the median, BERS's contributions for active members form a larger proportion of the total actuarial contribution than other pension funds with average maturity.

Ratio of Retiree Accrued Liability to Total Accrued Liability

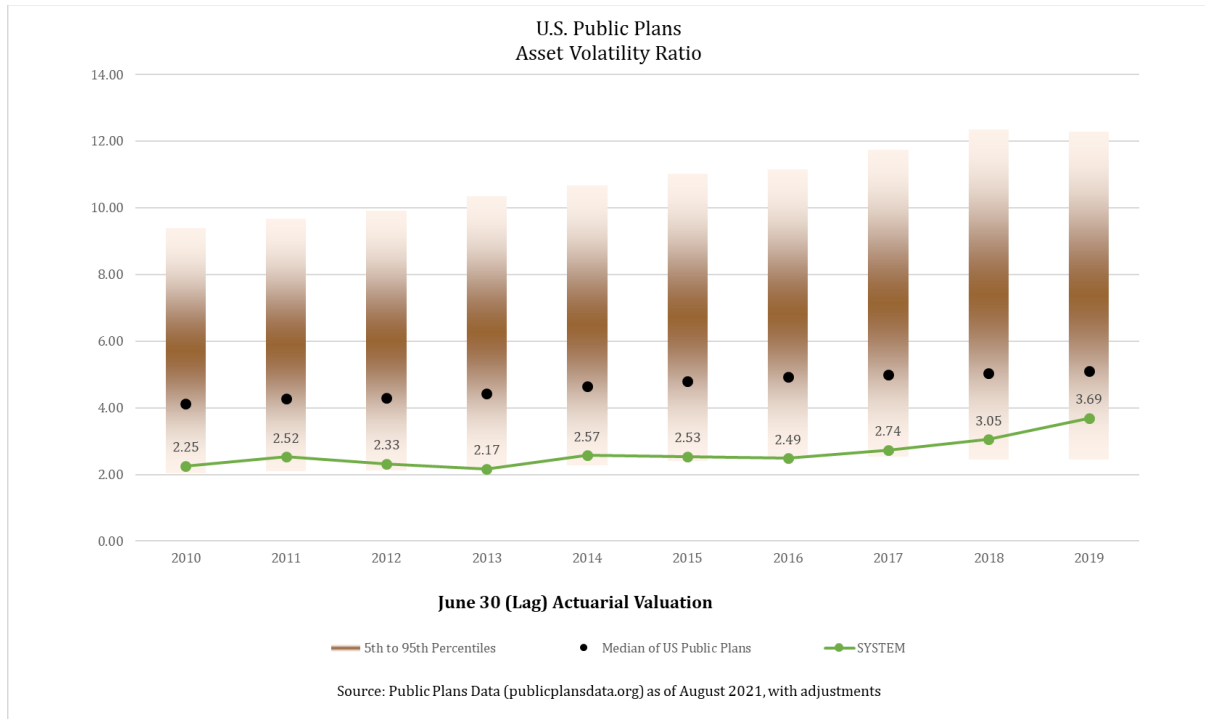
We can also consider the ratio of the Plan's retiree liability to its total liability. A new pension plan begins with this ratio at zero; as the plan matures, the ratio increases. Mature plans often have ratios above 60%. This measure is shown in the graph below for BERS; the other New York City Retirement Systems¹ are included for comparison purposes. The ratio for BERS has been between 48-51% for the past few years, indicating that BERS is not a fully mature retirement system.



Asset Volatility Ratio

Another way to look at plan maturity is the Asset Volatility Ratio (AVR), or ratio of assets to payroll. This ratio tends to rise as plans mature because assets generally need to accumulate to provide for benefit payments. The chart below compares the AVR (on an AVA basis) for BERS to the population of public pension systems.

¹ New York City Employees' Retirement System (NYCERS); Teachers' Retirement System (TRS); Police Pension Fund (POLICE); Fire Pension Fund (FIRE)



As a plan approaches maturity, AVRs tend to increase, and the plan's actuarially-determined contribution becomes more sensitive to investment losses. For example, the same percentage of investment losses in more mature plans with a larger asset base can increase contributions as a percentage of payroll more than in less mature plans, leading to additional volatility. Therefore, mature plans may wish to consider more conservative investment strategies. Typical AVRs for a mature retirement system are between 5 and 6. As shown in the tables above, for BERS, since ratios are lower than the average, BERS is not considered a mature plan under this measure.

Interest Rate Risk: The Risk of Reduction in the Long-Term Rate of Return

The Accrued Liability for the Plan depends heavily on the actuarial assumption used for future investment returns. While the returns themselves can produce substantial volatility, as detailed in the Investment Risk subsection above, the long-term rate of return assumption of 7.0% is highly dependent on the allocation of Plan assets.

If market conditions or the allocation of Plan assets no longer support a long-term rate of return assumption of 7.0%, the Actuarial Interest Rate (AIR) may have to be reduced, which can significantly increase the Accrued Liability, Unfunded Accrued Liability, Normal Cost, and resulting contribution of the Plan. The sensitivity of the Accrued Liability, the Unfunded Accrued Liability, Funded Ratio, and Normal Cost of the Plan are shown below:

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM	
SENSITIVITY ANALYSIS AS OF JUNE 30, 2019	
Valuation Date	June 30, 2019
Results at 7.00%	
1. Accrued Liability	\$ 5,306,985,850
2. Actuarial Value of Assets (AVA)	<u>4,991,832,000</u>
3. Unfunded Accrued Liability (AVA Basis) (1. - 2.)	\$ 315,153,850
4. Funded Ratio (2. / 1.)	94.1%
5. Normal Cost	\$ 145,648,691
Results at 6.00%	
1. Accrued Liability	\$ 5,930,263,959
2. Actuarial Value of Assets (AVA)	<u>4,991,832,000</u>
3. Unfunded Accrued Liability (AVA Basis) (1. - 2.)	\$ 938,431,959
4. Funded Ratio (2. / 1.)	84.2%
5. Normal Cost	\$ 207,012,756
Sensitivity Analysis for 1.0% Reduction in Interest Rate	
1. Increase in Accrued Liability	11.7%
2. Increase in Unfunded Accrued Liability (AVA Basis)	197.8%
3. Decrease in Funded Ratio	9.9%
4. Increase in Normal Cost	42.1%

Longevity Risk: The Risk of Higher than Assumed Mortality Improvement

BERS faces risk in its assumption of future mortality rates. Actuarial experience studies were used to develop the base mortality rates assumed in the valuation; Society of Actuaries mortality improvement scale MP-2020 was subsequently applied to these base rates.¹

This scale MP-2020 is an assumption regarding the *improvement* of future mortality rates as compared to mortality when the experience studies were completed. The scale was developed using large amounts of historical data from the Social Security Administration. Risk therefore exists that the mortality improvement inherent in the Plan population is higher than the improvement seen in the population provided by the Social Security Administration. When mortality improvement is higher than assumed, plan participants will live longer than expected, and the Plan will pay more pension payments than had been previously funded.

Furthermore, while the scale uses recent experience to develop short-term mortality improvement rates, an actuarial assumption is applied to long-term mortality improvement rates based on expert opinion. A rate of 1.0% is assumed, which the Society of Actuaries characterizes as “neither overly optimistic nor too pessimistic with respect to future longevity improvements.”² Risk to the Plan exists, however, if Plan mortality experience shows higher levels of long-term mortality improvement; expert opinion can in some cases be flawed, particularly when past experience is not indicative or predictive of future experience.

In a letter dated June 28, 2019, Buck analyzed historical Plan experience and noted “it appears that historical mortality improvement in NYC pensioners has kept pace with, and in some cases may have exceeded slightly, the mortality improvement trends in historical Social Security Administration graduated rates that are based on a broad US population” and that “continued use of MP-20xx mortality improvement scales seems reasonable.” It may be prudent in future years, after longer trends can be observed, to quantify the effect of changing the ultimate mortality improvement rate to be higher than 1.0%.

Litigation Risk: The Risk of Legal Claims and Lawsuits

It is not uncommon for New York City to be a defendant in legal claims and lawsuits.³ In its most recent claims report, the Comptroller reports that in FY2020, NYC settled 13,741 claims and lawsuits for \$1.0 billion. On occasion, these settlements involve NYCERS. The 1996 case *Gulino v. Board of Education* awards damages to plaintiffs that in some cases include counterfactual service and salary in NYCERS. It remains a continuing risk that litigation may expand the scope of pension benefits beyond what is intended or codified in statute.

¹ Retirement Plans Experience Committee. “Mortality Improvement Scale MP-2020 Report,” “Mortality Improvement Scale MP-2018 Report,” and “Mortality Improvement Scale MP-2014 report.” *Society of Actuaries*.

² Retirement Plans Experience Committee. “Mortality Improvement Scale BB Report” 5.5 Selection of 1.0% Long-Term Rate of Mortality Improvement. *Society of Actuaries*.

³ <https://comptroller.nyc.gov/reports/annual-claims-report>

Other Risk Types

Credit/Solvency Risk: The Risk of Potential Insolvency of Contributing Entities

All public pension systems face credit risk in the event their sponsoring entities become unable to pay their debts and obligations. Credit rating agencies currently consider New York City bonds to be of high quality, and the Actuary believes the City faces low credit risk as a main contributing entity to BERS.

In addition, BERS is a multiple-employer plan with several contributing entities. BERS faces risk if contributing entities become insolvent while still carrying Unfunded Accrued Liability. Existing law and precedent transfer these amounts to other employers, creating imbalanced funding responsibility in the event of default. For example, in the final June 30, 2016 (Lag) actuarial valuation for FY18, the Department of Education assumed responsibility for unfunded liabilities associated with the Beginning with Children Charter School, which closed in 2016.

Inflation Risk: The Risk of Higher than Assumed Inflation

BERS faces risk if inflation is higher than expected. Inflation is a key driver of the salary increase assumptions (affecting active members) and COLA assumptions (affecting both active members and pensioners/beneficiaries). A quantitative analysis is not available at this time. Notably, however, the pensioner COLA is limited to half of CPI on the first \$18,000 of annual benefits, which limits the risk exposure to inflation.

Contribution Risk: The Risk that Future Contributions Are Less Than the Actuarially-Determined Contributions

Public pension systems can suffer from contribution risk when sponsoring governmental entities fail to make contributions as determined by the actuary under their funding policies. A 2018 study¹ which used data from 50 states and 230 retirement systems, found that since 2007 the shortfall between actual contributions to state pension plans and minimum actuarial funding standards was \$200 billion.²

The New York City Retirement Systems and Pension Funds face low contribution risk. City benefits are constitutionally protected, and participating employers have historically contributed to the actuarial contribution as certified by the Actuary. The Actuary believes the City will continue to do so in future years. See Table III-5 ACTUARIAL AND STATUTORY CONTRIBUTION HISTORY.

Contribution risk may also increase in future years if the actuarial contribution determined for the Plan grows to be a larger part of the City budget. The five New York City Retirement Systems and Pension Funds currently require contributions of over 10% of the City's annual budget, and contribution risk may increase if this contribution rate becomes untenable.

¹ The Pew Charitable Trusts. *"The State Pension Funding Gap: 2018."*

² Accounting standards changed in 2014. From 2007 to 2013, the shortfall is calculated between the actuarial recommended contribution and actual employer contributions. From 2014 to 2018, the shortfall represents the gap between the net amortization benchmark and employer contributions.

Agency/Political Risk: The Risk of Stakeholder Influences

With assumed long-term asset returns and gradual amortization of unfunded liabilities, the funded status of the Plan is expected to improve over time. Many public pension systems suffer from agency risk, wherein different stakeholders or agents want to influence the cost calculations in directions favorable to their interests. Agents may also downplay other risks (e.g. investment risk) to advance specific agendas. These situations create cases where promises for future funding can be disregarded for political expediency or other priorities. In other cases, certain plan provisions or administrative practices intended to provide occasional clarity or relief become commonplace or intentionally sought for the benefit of members at the expense of taxpayers.

Intergenerational Equity Risk: The Risk of Inequity in the Actuarially-Determined Contributions

Intergenerational inequity could exist for certain stakeholders (e.g. public taxpayers). If, for example, liabilities are valued using overly conservative assumptions, aggressive funding patterns may occur, thus causing current taxpayers to shoulder a disproportionately high share of the funding burden, as compared to past and future taxpayers. The reverse can also be true if aggressive or unrealistic assumptions are used. As the Plan is ongoing, taxpayers across all generations should be expected to offer similar funding contributions over the lifetime of the Plan.

Additionally, in future years of higher or lower funded status, changes in statute may take place that improve or diminish plan provisions. If so, intergenerational equity risk could increase as taxpayers and plan members at that time may receive preferential or less preferential treatment over the taxpayers and plan members prior to and subsequent to them.

SECTION VIII – SUMMARY OF PLAN PROVISIONS

A. Covered Employment

Membership in BERS is open to all employees of the Department of Education who are not eligible to participate in the New York City Teachers' Retirement System. In addition, employees of the New York City School Construction Authority, employees of the Office of the Special Commissioner of Investigation, School Crossing Guards employed by the New York City Police Department, and employees of NYC charter schools that have elected and are approved to participate in the plan may also be eligible for membership. Membership in BERS may be voluntary or mandated.

B. Tier Membership

Tier membership is based on the date that the member joined BERS. The tier status of earlier membership in BERS or another New York City or New York State public employee retirement system is reflected, but only if the service associated with that membership is purchased and included in Credited Service.

Tier 1: Prior to July 1, 1973

Tier 2: July 1, 1973 through July 26, 1976

Tier 4: July 27, 1976 through March 31, 2012

Tier 6: April 1, 2012

Tier 4 members who joined BERS before September 1, 1983 may elect a Tier 3 benefit. Unless otherwise noted, Tier 1 and Tier 2 provisions are hereafter omitted for brevity.¹ For more information about plan provisions, see the applicable Summary Plan Descriptions at www.nycbers.org. In the event of a conflict between this summary and applicable law, the applicable laws will govern.

C. Basic Member Contributions (BMC)

Basic Member Contributions earn 5% interest per year, compounded annually.

Tier 4: The contribution rate is 3% of Salary. Tier 4 members contribute BMC for the first 10 years of Credited Service except members of the Chapter 504 55/27 plan contribute BMC for the first 27 years of Credited Service.

¹ Only approximately 0.1% of active members as of June 30, 2019 are members of Tier 1 and Tier 2.

Tier 6: BMC are made for all years of Credited Service according to the following schedule:

Lookback Wages	BMC Contribution Rate
Up to \$45,000	3.00%
\$45,001 up to \$55,000	3.50%
\$55,001 up to \$75,000	4.50%
\$75,001 up to \$100,000	5.75%
Greater than \$100,000	6.00%

The lookback wages used for determining the Tier 6 BMC contribution rate for a plan year are the actual wages earned two plan years prior to the plan year. A projected salary is used during the first three years of Credited Service. The BMC contribution rate was limited to 3% from April 1, 2012 through March 31, 2013.

D. Additional Member Contributions (AMC)

Additional Member Contributions including AMCs for work in physically taxing employment (AMC-PT) earn 5% interest per year, compounded annually.

Tier 4: Members of the Basic 62/5 plan do not make AMC. For other Tier 4 members, the AMC contribution rate as a percentage of Salary varies by plan in accordance with the following schedule:

Plan Description	AMC Contribution Rate	Years Required
Chapter 96 55/25	1.85% ¹	30
Chapter 96 57/5		
Chapter 19 55/25	1.85%	25
Chapter 19 55/27	1.85%	27
Special Officers 25-yr plan	6.25%	30
Auto Mechanics 50/25-yr plan	4.83%	30
Chapter 504 55/27 plan	1.85%	All years

Tier 6: Members of the 63/10 plan do not make Additional Member Contributions. For members of the Special Officers 25-yr plan and Auto Mechanics 50/25-yr plan, AMC contributions of 6.25% and 4.83%, respectively, are required for the first 30 years of Credited Service.

¹ Members of Chapter 96 55/25 and 57/5 who work in physically taxing employment contribute an additional 1.98%, on top of the 1.85%.

E. Credited Service

Credited Service is comprised of Membership Service, Part-time Service, Previous Service, Transferred Service, and Military Service:

1. **Membership Service**: Service earned while a member of BERS.
2. **Part-time Service**: Service that is prorated based on the number of hours or days worked in the year.
3. **Previous Service**: Service earned prior to membership while employed by the Department of Education, the City of New York, the State of New York, or any of its political subdivisions, or by another covered employer.
4. **Transferred Service**: Service earned as a member of another public retirement system in the City or State of New York.
5. **Military Service**: Service for qualified time served in one of the armed forces of the United States.

Previous Service, Transferred Service, and Military Service must be purchased to count as Credited Service. Payments made for purchasing Military Service are considered Employer contributions.

F. Salary

Salary is based on the annual wages earned in covered employment including overtime pay. Some limitations apply for the Salary used to determine Final Average Salary (FAS).

Tier 4: Wages greater than 110% of the average of the previous two years are excluded for purposes of determining FAS.

Tier 6: Wages greater than 110% of the average of the previous four years are excluded for purposes of determining FAS. In addition, the following payments are also excluded from wages for purposes of determining FAS:

1. Wages greater than the annual salary paid to the Governor of the State of New York;
2. Lump sum payments for deferred compensation, sick leave, accumulated vacation, or other credits for time not worked;
3. Overtime greater than the overtime ceiling of \$15,000, effective April 1, 2012 and indexed annually by the Consumer Price Index (CPI-U);
4. Any form of termination pay;
5. Any additional compensation paid in anticipation of retirement; and

6. In the case of employees who receive wages from three or more employers in a twelve-month period, the wages paid by the third and each successive employer.

G. Final Average Salary (FAS)

Service retirement, early retirement, disability retirement, and vested retirement benefits are based on FAS.

Tier 4: FAS is the highest average Salary earned in any three consecutive years of Credited Service or in the final 36 months of Credited Service if greater.

Tier 6: FAS is the highest average Salary earned in any five consecutive years of Credited Service or in the final 60 months of Credited Service if greater.

H. Service Retirement

1. Eligibility: The eligibility requirements for an unreduced service retirement are summarized in the table below:

Tier	Plan Description	Minimum Age	Minimum Service
4	Basic 62/5 plan	62	5
4	Chapter 96 55/25 plan	55	25
4	Chapter 96 55/25 plan Physically-Taxing	50	25
4	Chapter 96 57/5 plan	57	5
4	Chapter 96 57/5 plan Physically-Taxing	50	25
4	Chapter 19 55/25	55	25
4	Chapter 19 55/27	55	27
4	Special Officers 25-yr plan	N/A	25
4	Auto Mechanics 50/25-yr plan	50	25
4	Chapter 504 55/27 plan	55	27
6	Basic 63/10 Plan	63	10
6	Special Officers 25-yr plan	N/A	25
6	Auto Mechanics 50/25-yr plan	50	25

2. Benefits:

a. Tier 4 Plans except for the Special Officers 25-year plan and Auto Mechanics 50/25-yr plan:

- i. Less than 20 years of Credited Service: $1/60$ times FAS times Credited Service
- ii. 20 or more years of Credited Service: Sum of 2.0% times FAS times Credited Service up to 30 years plus 1.5% times FAS times Credited Service in excess of 30 years.

b. Basic Tier 6 63/10 Plan:

- i. Less than 20 years of Credited Service: $1/60$ times FAS times Credited Service;
- ii. 20 or more years of Credited Service: Sum of 35% times FAS plus 2.0% times FAS times Credited Service in excess of 20 years.

c. Tier 4 and Tier 6 Special Officers 25-year and Auto Mechanics 50/25-yr plans:

- i. 2.0% times FAS times Credited Service up to 30 years.

I. Early Retirement

1. Eligibility: Not all plans provide for early retirement. However, certain participants may be eligible for early retirement under the Tier 4 or Tier 6 Basic plans. The eligibility requirements for early retirement plans are summarized in the table below:

Tier	Plan Description	Minimum Age	Minimum Service
4	Basic 62/5 plan	55	5
4	Chapter 504 55/27 plan	55	10
6	Basic 63/10 plan	55	10

2. Benefits:

The service retirement benefit is reduced for early retirement based on the age at commencement.

a. Tier 4 Basic 62/5 Plan:

The service retirement benefit is reduced by 0.50% for each of the first 24 months that the age at commencement precedes age 62, and reduced 0.25%

for each of the next 60 months that the age of commencement precedes age 60:

Age	Early Retirement Factor
61	0.94
60	0.88
59	0.85
58	0.82
57	0.79
56	0.76
55	0.73

b. Tier 6 Basic 63/10 Plan:

The service retirement benefit is reduced by 13/2400 for each month (i.e. 6.5% per year) that the age of commencement precedes age 63.

J. Disability Retirement

1. Accidental Disability (ADR)

- a. Eligibility: No age or service requirement. Requires Medical Board determination that the active member is physically or mentally incapacitated due to an accident in the performance of duties and that the accident is not due to willful negligence of the member.
- b. Benefits: Greater of 1/60 times FAS times Credited Service or 1/3 times FAS. The member may elect a service retirement benefit, if eligible.

2. Ordinary Disability (ODR)

- a. Eligibility: 10 years of Credited Service. Requires Medical Board determination that the member is physically or mentally incapacitated while an active member.
- b. Benefits: Greater of 1/60 times FAS times Credited Service or 1/3 times FAS. The member may elect a service retirement benefit, if eligible.

K. Death Benefits

1. Accidental Death Benefits

- a. Eligibility: No age or service requirement. Death due to the performance of duties while an active member.
- b. Benefits: A monthly pension is payable to the beneficiary equal to 50% of 1/12 of annual wages earned during the year prior to death. The benefit is equal to 50% of 1/12 of the annual wage rate if the member had less than one year of Credited Service.

2. Ordinary Death Benefit

a. Eligibility

- i. Active members: No age or service requirement. Death during active employment while not in the performance of duties.
- ii. Terminated vested members: Death after termination of employment and prior to benefit commencement.
- iii. Retired Members: Death after benefit commencement.

b. Benefits

- i. Active members: Refund of BMC and the employee portion of AMC, if any, with interest plus a salary-based death benefit. The salary-based death benefit is equal to one year's wages times completed years of Credited Service up to 3 years. The salary-based portion of the death benefit is reduced 5% for each year the member remains in service beyond age 60 (to a maximum reduction of 50% at age 70).
- ii. Terminated vested members with 10 or more years of Credited Service: Refund of BMC and the employee portion of AMC, if any, with interest plus one half of the salary-based death benefit that would have been payable had the member died on the last day of active service as described above.
- iii. Terminated vested members with less than 10 years of Credited Service: Refund of BMC and the employee portion of AMC, if any, with interest.
- iv. Retirees: The active salary-based death benefit that would have been payable had the member died on the last day of active service times the Adjustment Factor described in the table below:

Year of Death	Adjustment Factor
1 st year after retirement	50%
2 nd year after retirement	25%
3 rd year or later after retirement	10% times the benefit in effect at age 60 or at retirement if earlier

- c. Form of Payment: Lump sum.

L. Vested Benefit After Termination

1. Eligibility

- a. Tier 4 Chapter 504 55/27 plan: 10 years of Credited Service.
- b. All other Tier 4 plans: 5 years of Credited Service.
- c. Tier 6 plans: 10 years of Credited Service.

- 2. Benefits: The vested benefit is equal to the amount of the Service Retirement benefit (unless noted otherwise below), payable at the times specified below.

- a. Tier 4 Special Officers 25-year plan: When the member would have earned 25 years of Credited Service if he or she had continued working in covered employment.
- b. Tier 4 Auto Mechanics 50/25-year plan: When the member would have earned 25 years of Credited Service if he or she had continued working in covered employment, but not prior to age 50.
- c. All other Tier 4 plans: Age 62.
- d. Tier 6 Plans: Age 63. In no case can the vested benefit be less than the annuity equivalent of the BMC.

M. Forms of Payment

- 1. Normal Form of Payment: Single Life Annuity.
- 2. Optional Forms of Payment: Joint and Survivor Annuities, Certain and Life Annuities, and Pop-up Annuities.

N. Cost of Living Adjustments (COLA)

Annuity payments are increased annually on September 1st, but only after a pensioner has attained the applicable eligibility threshold. Some beneficiaries are not eligible for COLA increases. The COLA increase is equal to a base benefit times a COLA percentage. The COLA

increase for a spouse receiving a joint & survivor annuity is one half of the COLA increase that would have been applicable to the member had he or she survived.

1. Eligibility Thresholds:
 - a. Service Retirement and Vested Retirement: The earlier of (i) and (ii):
 - i. Attainment of age 62 and 5 years since commencement
 - ii. Attainment of age 55 and 10 years since commencement
 - b. Disability Retirement: 5 years since commencement
 - c. Beneficiaries of an Accidental Death benefit: 5 years since commencement
2. Eligible beneficiaries: Spouses receiving a joint & survivor annuity. All others are non-eligible.
3. Base Benefit: The lesser of \$18,000 and the maximum retirement allowance plus the sum of prior years' COLA increases.
4. COLA percentage: 50% of the Consumer Price Index (CPI-U) based upon the 12 months ending March 31 prior to each September 1 effective date, rounded to the next higher 0.1%. Such percentage shall not be less than 1.0% nor greater than 3.0%.

O. Refund of BMC and AMC

Refunded with interest under some circumstances. AMC include Additional Member Contributions for work in physically taxing employment (AMC-PT). Only the employee portion of AMC is refunded.

1. Employee Portion of AMC: 50% for all plans that require AMC except for the Special Officers and Auto Mechanics plans, it is 100%.
2. Non-vested termination: BMC and employee portion of AMC are refunded with interest.
3. Vested termination:
 - a. A member may elect a refund of BMC and the employee portion of AMC with interest in lieu of a pension benefit, but only if he or she has less than 10 years of Credited Service.
 - b. A member of one of the Special Officer plans may elect a refund of AMC in lieu of remaining in the Special Officers 25-year plan if he or she leaves service as a special officer prior to earning 15 years of Credited Service as a special officer.

- c. A member of one of the Auto Mechanics plans may elect a refund of AMC in lieu of remaining in the Auto Mechanics 50/25-year plan if he or she leaves service as an auto mechanic prior to earning 5 years of Credited Service as an auto mechanic.
- 4. Ordinary death: BMC and the employee portion of AMC are refunded with interest.
- 5. Accidental death: The employee portion of AMC are refunded with interest.
- 6. Disability Retirement: The employee portion of AMC are refunded with interest.
- 7. Service Retirement: The employee portion of AMC are refunded with interest if the member retires on or after age 62. For retirement prior to age 62, the employee portion of AMC-PT are refunded if a member of the Chapter 96 55/25 plan retires on or after age 55 with 25 years of Credited Service or if a member of the Chapter 96 57/5 plan retires on or after age 57 with 25 years of Credited Service.

P. Service and Early Retirement for Tier 4 Members with Tier 3 Rights

- 1. Eligibility: Age 55 and 5 years of Credited Service.
- 2. Benefits: These members may elect a Tier 3 benefit instead of a Tier 4 benefit. The benefit formula for Tier 3 is the same as the benefit formula for the Tier 4 Basic 62/5 plan except:
 - a. Credited Service under the Tier 3 benefit formula is capped at 30 years,
 - b. The Tier 3 benefit formula includes an offset starting at age 62 equal to 50% of the Primary Social Security benefit, and
 - c. The early retirement factors used to reduce benefits for early commencement are smaller and thus reduce benefits more for Tier 3 than the corresponding factors used under the Basic Tier 4 62/5 plan.
- 3. Cost of Living Adjustments: Tier 3 retirement benefits may be adjusted annually by Escalation. A Tier 3 retirement benefit cannot be less than the initial benefit payable at the commencement date.
 - a. Full Escalation: Applicable for benefits commencing on or after age 65. Equal to the lesser of 3% and the Consumer Price Index (CPI-U) for positive

increases in the CPI-U, and the greater of -3% and the Consumer Price Index (CPI-U) for negative increases in the CPI-U.

- b. Partial Escalation: Applicable for benefits commencing after age 62 and prior to age 65. Equal to full escalation reduced by 1/36 times the number of months that the age at commencement precedes age 65.

Q. Loans

A member may borrow up to 75% of the accumulated BMC with interest. A member's unpaid loan balance will reduce his or her retirement benefit.

R. Tax-deferred Annuity Program (TDA)

Members may elect to make voluntary employee contributions to the BERS TDA. A member's contributions to a TDA account are capped by the dollar limitations under §402(g)(1) of the Internal Revenue Code on the exclusion for elective deferrals described in §402(g)(3), and the dollar limitation under §414(v)(2)(B)(i) of the Internal Revenue Code for catch-up contributions for members who have attained aged 50.

A member may withdraw his or her TDA account balance as a lump sum or convert a portion of the accumulated balance into an annuity upon retirement.

S. Changes Since the Prior Valuation

None.

SECTION IX – CHAPTER AMENDMENTS

The June 30, 2019 (Lag) actuarial valuation results reflect the following Chapter amendments from the prior five years.

- **Chapter 266 of the Laws of 2018** (Chapter 266/18) extends the deadline to file a Notice of Participation in the World Trade Center Rescue, Recovery, and Cleanup Operations to September 11, 2022.
- **Chapter 41 of the Laws of 2016** (Chapter 41/16) provides up to three years of service credit to members of public retirement systems of the State of New York for military service. Chapter 41/16 removes the requirement that such military service occur during specified periods of hostilities.
- **Chapter 438 of the Laws of 2016** (Chapter 438/16), enacted on November 14, 2016, amended Retirement and Social Security Law Section 43 to eliminate restrictions upon transferring between public retirement systems.
- **Chapter 510 of the Laws of 2015** (Chapter 510/15), clarifies for Tier 6 the definition of multiple employers for the purpose of exclusion of wages and changes the plan year for contributions from April 1 – March 31 to January 1 – December 31.
- **Chapter 427 of the Laws of 2014** (Chapter 427/14), amended Military Law Section 243-d, effective November 4, 2014, to provide non-contributory retirement service credit for members of the New York City Retirement Systems called to active military duty on or after September 11, 2001 and prior to January 1, 2006 who did not receive his or her full salary from a participating employer and is otherwise eligible to receive retirement service credit for such service.

SECTION X – SUBSEQUENT EVENTS

The following legislation was adopted after the June 30, 2019 valuation date and could have a significant impact on future years' valuations:

Effective March 1, 2020, **Chapter 89 of the Laws of 2020** (Chapter 89/20) provides death benefits to statutory beneficiaries of members whose death was a result of or was attributed to COVID-19. **Chapter 78 of the Laws of 2021** (Chapter 78/21) amends Chapter 89/20 by extending the eligibility window of these death benefits through December 31, 2022.

Chapter 424 of the Laws of 2021 (Chapter 424/21) expands eligibility of certain public service employees for participation in the World Trade Center Rescue, Recovery, or Clean-up Operations.

SECTION XI – ACTUARIAL ASSUMPTIONS AND METHODS

The actuarial assumptions and methods used for the June 30, 2019 valuation were presented in the memorandum titled “Proposed Changes to Actuarial Assumptions and Methods (Revised 2021 AM)” dated July 16, 2021, which was adopted by the Board of Trustees at the September 23, 2021 Board meeting.

The Actuary reset the Actuarial Value of Assets (AVA) to the market value as of June 30, 2019. Beginning with the June 30, 2020 (Lag) actuarial valuation, the Actuarial Asset Valuation Method (AAVM) recognizes investment returns greater or less than expected over a period of five years. In accordance with this AAVM, Unexpected Investment Returns (UIR) are phased into the AVA at rates of 20% per year.

The post-commencement mortality improvement table was changed from the MP-2018 to MP-2020. The MP-2020 table was also applied to the base mortality rates for active members and terminated members prior to commencement.

The assumption for the amount of the basic member contribution balance elected by active members as a loan upon benefit commencement was changed from 75% of BMC for Tier 1 and 2 active members only to 25% of BMC for all active members.

The actuarial assumptions and a description of the actuarial methods follow.

Table XI-1
Active Retirement Rates

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM					
PROBABILITIES OF SERVICE RETIREMENT					
Age	Reduced Service Retirement	Unreduced Service Retirement Probabilities For Members Who Did Not Elect an Improved Retirement Program		Unreduced Service Retirement Probabilities For Members Who Elected an Improved Retirement Program	
		Year 1	Ultimate	Year 1	Ultimate
55	2.50%	15.00%	0.00%	35.00%	0.00%
56	2.50%	15.00%	6.50%	35.00%	12.00%
57	2.50%	15.00%	6.50%	35.00%	12.00%
58	2.50%	15.00%	6.50%	35.00%	12.00%
59	3.75%	15.00%	6.50%	35.00%	12.00%
60	5.00%	15.00%	6.50%	35.00%	12.00%
61	6.25%	15.00%	10.00%	35.00%	12.00%
62	7.50% ¹	20.00%/15.00% ²	10.00%	50.00%	20.00%
63	0.00%	15.00%/20.00% ³	10.00%	35.00%	15.00%
64	0.00%	15.00%	10.00%	35.00%	15.00%
65	0.00%	20.00%	15.00%	50.00%	20.00%
66	0.00%	15.00%	10.00%	35.00%	15.00%
67	0.00%	15.00%	10.00%	35.00%	15.00%
68	0.00%	15.00%	10.00%	35.00%	15.00%
69	0.00%	15.00%	10.00%	35.00%	15.00%
70	0.00%	20.00%	20.00%	35.00%	15.00%
71	0.00%	20.00%	20.00%	35.00%	15.00%
72	0.00%	20.00%	20.00%	35.00%	15.00%
73	0.00%	20.00%	20.00%	35.00%	15.00%
74	0.00%	20.00%	20.00%	35.00%	15.00%
75	0.00%	20.00%	20.00%	35.00%	15.00%
76	0.00%	20.00%	20.00%	35.00%	15.00%
77	0.00%	20.00%	20.00%	35.00%	15.00%
78	0.00%	20.00%	20.00%	35.00%	15.00%
79	0.00%	20.00%	20.00%	35.00%	15.00%
80+	NA	100.00%	100.00%	100.00%	100.00%

¹ 7.50% only applies to Tier 6 members; 0.00% otherwise.

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

³ 15.00% for Tier 1, 2, & 4 members and 20.00% for Tier 6 members.

Table XI-2
Active Termination Rates

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

Table XI-3
Active Disability Rates

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

Table XI-4
Active Mortality Rates

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

Table XI-5
Service Retiree Mortality

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

Table XI-6
Disabled Retiree Mortality

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

Table XI-7
Beneficiary Mortality

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

Table XI-8
Salary Scale

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

¹ Salary increase is the General Wage Increase of 3% plus the Merit Increase.

Additional Assumptions and Methods

1. **Mortality Assumption:** The mortality base tables are projected from 2012 using mortality improvement table MP-2020. The post-commencement base tables are also multiplied by adjustment factors to convert them from lives-weighted to amounts-weighted tables to account for socioeconomic effects on mortality. The adjustment factors used are as follows:

	Adjustment Factor	
	Male	Female
Service Retiree	0.980	0.980
Disabled Retiree	0.980	0.980
Beneficiary	0.890	0.951

2. **Marital Assumption:** All active members are assumed to be married, males are assumed to be four years older than their female spouses and females are assumed to be two years younger than their male spouses.
3. **Credited Service:** Calculated in whole year increments for valuation purposes.
4. **Loans:** Except for Death Benefits, it is assumed that eligible members take a loan at retirement equal to 25% of their member contribution balances.
5. **Actuarial Interest Rate (AIR):** 7.0% per annum, net of investment expenses.
6. **COLA:** Based on an assumed long-term Consumer Price Index inflation rate of 2.5% per year. 1.5% per year for Auto COLA, 2.5% per year for Escalation.
7. **Actuarial Asset Valuation Method (AAVM):**

The Actuary reset the AVA to the market value as of June 30, 2019.

Beginning with the June 30, 2020 (Lag) actuarial valuation, the AAVM recognizes investment returns greater or less than expected over a period of five years. In accordance with this AAVM, Unexpected Investment Returns (UIR) are phased into the AVA at rates of 20% per year.

The AVA is further constrained to be within a corridor of 80% to 120% of the market value.

Beginning with the June 30, 2018 (Lag) actuarial valuation, the method used to determine the Actuarial Value of Assets was calculated by re-characterizing interest credited on TDA Fixed Fund account balances as investment income instead of as a cash disbursement.

For more information, see SECTION II – MARKET AND ACTUARIAL VALUES OF ASSETS.

8. **Actuarial Cost Method:** The Entry Age Normal (EAN) cost method of funding is used by the Actuary to calculate the Employer Contribution.

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

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

Under this method, actuarial gains and losses, as they occur, reduce and increase the UAL, respectively, and are explicitly identified and amortized. Increases or decreases in obligations due to benefit changes, actuarial assumption changes, and actuarial method changes are also explicitly identified and amortized.

The explicit UALs that are developed each year under EAN are generally financed over fixed periods. For more information see Page 12.

Under EAN, the Normal Cost as a percentage of pay remains constant by individual and changes gradually over time for the entire plan as the characteristics of the group changes (e.g. more Tier 6 active members decrease the average Normal Cost as a percentage of pay).

9. **Allowances for Administrative Expenses:** The Employer Contribution for a fiscal year is increased by the interest-adjusted amount of administrative expenses paid from BERS during the second prior fiscal year.
10. **WTC Disability and Death Benefits:** Obligations attributable to the WTC Disability Benefits Law and to the WTC Death Benefits Law are determined through the use of explicit assumptions in the Revised 2021 A&M, and through estimation techniques for post-retirement reclassifications.
11. **One-Year Lag Methodology (OYLM):** One-Year Lag Methodology uses a June 30, XX-2 valuation date to determine Fiscal Year XX employer contributions.

This methodology requires adjustments to certain components used to determine the Fiscal Year XX employer contributions as follows:

a. Normal Cost

The normal cost as of June 30, XX-2 is rolled forward with the assumed AIR of 7.0% to derive the normal cost as of December 31, XX-1.

b. UAL Payments

For determining the UAL payments for Fiscal Year XX, and to be consistent with the OYLM, the UAL as of June 30, XX-2 is adjusted by the discounted value of employer normal cost and UAL payments paid during Fiscal Year XX-1 and the discounted value of Administrative Expenses reimbursed during Fiscal Years XX-1 and XX.

12. **Excess Benefits:** The valuation includes liabilities and costs, if any, associated with benefits in excess of the Internal Revenue Code Section 415 limitation.

13. **Term Cost for TDA Fixed Fund:** 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.

SECTION XII – SUMMARY OF DEMOGRAPHIC DATA

The June 30, 2019 (Lag) and June 30, 2018 (Lag) actuarial valuations are based upon census data as of those dates submitted by the Plan's administrative staff and the employers' payroll facilities. Financial information was provided by the Office of the Comptroller as of June 30, 2019 and June 30, 2018.

Consistent with Actuarial Standards of Practice, the Office of the Actuary has reviewed census data and financial information for consistency and reasonability but has not audited it. The accuracy of the results and calculations contained in this Report are dependent on the accuracy of this census data and financial information. To the extent any such data or information provided is materially inaccurate or incomplete, the results contained herein will require revision.

Table XII-1
Status Reconciliation

CHANGES IN THE NUMBER OF ACTIVES AND PENSIONERS DURING THE FISCAL YEAR CLASSIFIED BY STATUS										
Status	(1) Active Members	(2) Active Off Payroll Members	(3) Deferred Vested	(4) Service Pension	(5) Ordinary Disability	(6) Accidental Disability	(7) Accidental Death	(8) Other Beneficiary	(9) Pensioners Subtotal (4) to (8)	(10) Grand Total (1) + (2) + (3) + (9)
Number at June 30, 2018	25,864	10,525	1,934	15,979	1,085	209	2	766	18,041	56,364
New Entrants	2,431	727	10	0	0	0	0	0	0	3,168
Rehires	316	(304)	(12)	0	0	0	0	0	0	0
Leaving Active Payroll	(1,734)	1,767	(33)	0	0	0	0	0	0	0
Vested Termination	(109)	(121)	230	0	0	0	0	0	0	0
Non-Vested Termination / Cashout	(34)	(878)	(10)	0	0	0	0	0	0	(922)
Accidental Death (from Active)	0	0	0	0	0	0	0	0	0	0
Ordinary Death (from Active)	(51)	(63)	(16)	0	0	0	0	0	0	(130)
Service Retirement	(780)	(188)	(82)	1,050	0	0	0	0	1,050	0
Ordinary Disability Retirement	(71)	(29)	(2)	0	102	0	0	0	102	0
Accidental Disability Retirement	(7)	(14)	0	0	0	21	0	0	21	0
Death with Beneficiary	0	0	0	(232)	(19)	(4)	0	255	0	0
Death without Beneficiary	0	0	0	(665)	(34)	(4)	0	(51)	(754)	(754)
Off Pension Payroll	0	0	0	24	2	1	0	15	42	42
Net Change	(39)	897	85	177	51	14	0	219	461	1,404
Number at June 30, 2019	25,825	11,422	2,019	16,156	1,136	223	2	985	18,502	57,768

Graph XII-2
Headcount Summary by Status

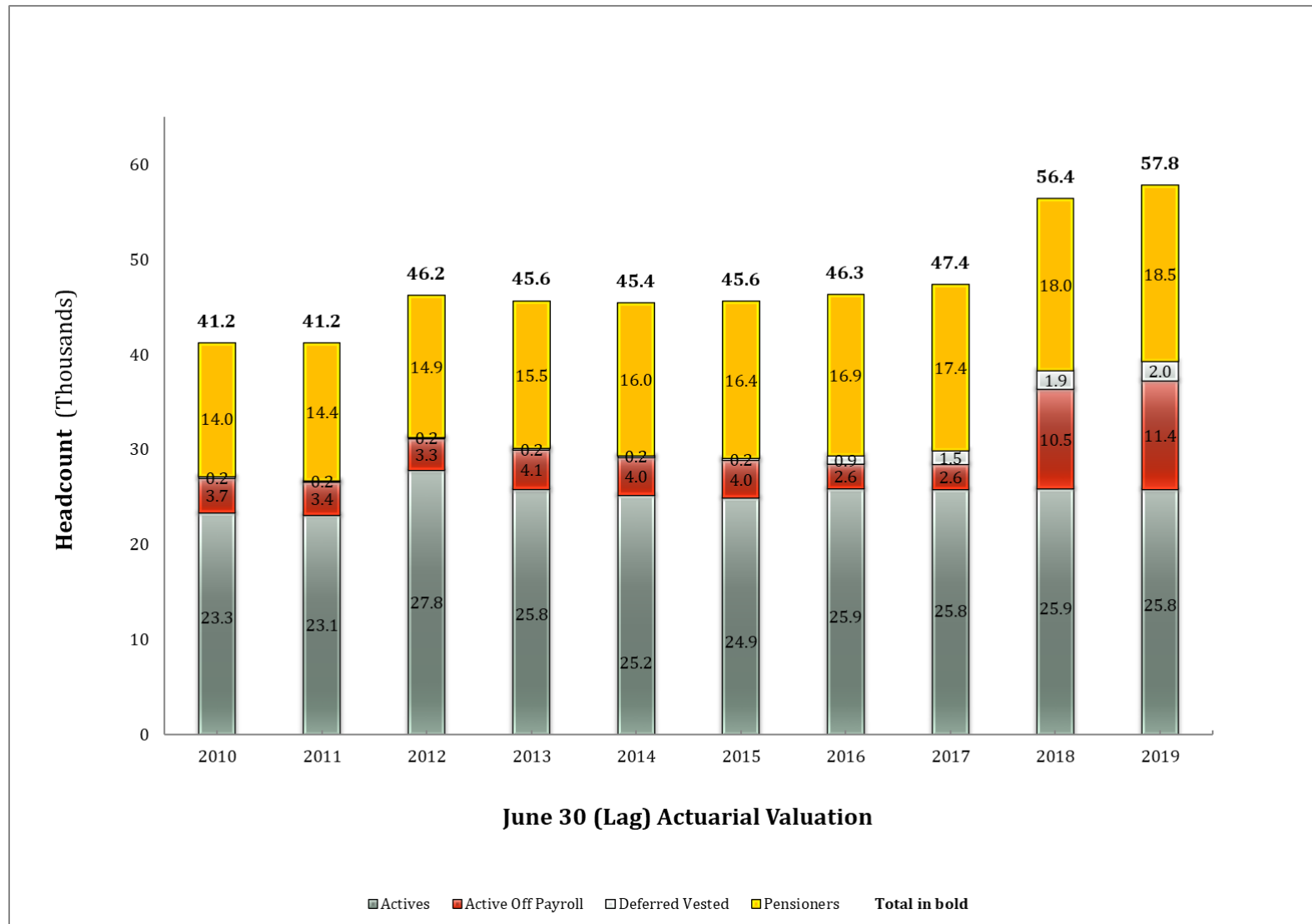


Table XII-3
Summary of Active Membership

NEW YORK CITY BOARD OF EDUCATION RETIREMENT SYSTEM		
ACTIVE MEMBERS INCLUDED IN THE JUNE 30, 2019 (LAG) AND THE JUNE 30, 2018 (LAG) ACTUARIAL VALUATIONS		
	June 30, 2019 (Lag)	June 30, 2018 (Lag)
Number		
Males	6,797	6,602
Females	19,028	19,262
Total	25,825	25,864
Annual Salary ¹		
Males	\$ 484,067,258	\$ 450,529,399
Females	869,199,097	829,773,071
Total	\$ 1,353,266,355	\$ 1,280,302,470
Average Salary ¹		
Males	\$ 71,218	\$ 68,241
Females	45,680	43,078
Total Average	\$ 52,401	\$ 49,501
Average Age		
Males	48.9	49.0
Females	51.4	51.8
Total Average	50.8	51.1
Average Past Service		
Males	9.7	10.0
Females	9.1	9.3
Total Average	9.3	9.5

¹Salaries reflect the impact of recent labor contract settlements and certain non-union salary increases with retroactive effective dates, if any.

Graph XII-4
Active Membership by Tier

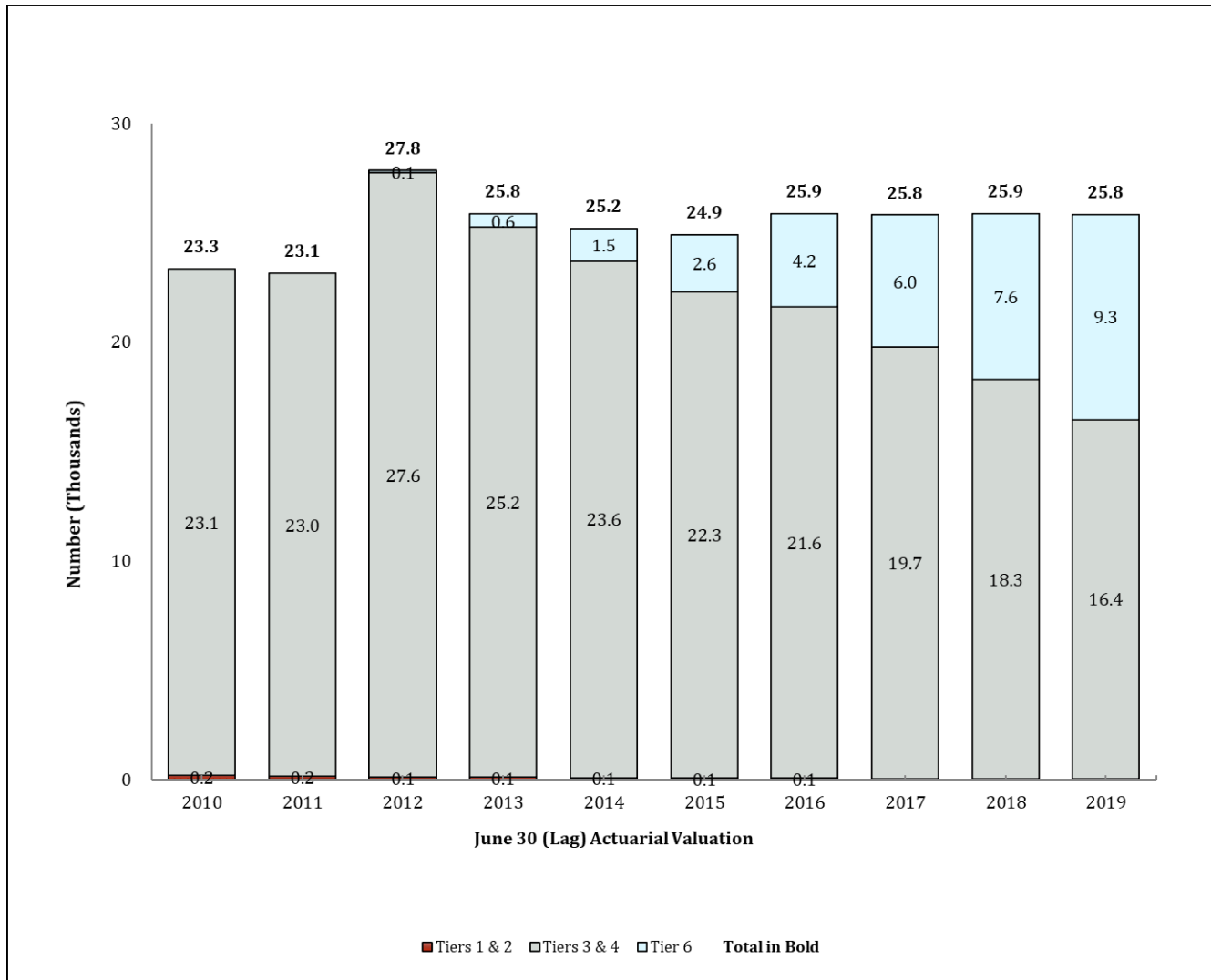


Table XII-5
Historical Active Member Salary Data

June 30 (Lag) Actuarial Valuation	Number	Annual Salary	Average Annual Salary	Percentage Increase/ (Decrease) In Avg. Salary
2010	23,324	912,290,136	39,114	0.1%
2011	23,131	920,369,154	39,789	1.7%
2012	27,840	1,018,895,365	36,598	(8.0%)
2013	25,848	1,051,571,168	40,683	11.2%
2014	25,182	1,045,187,738	41,505	2.0%
2015	24,903	1,093,962,316	43,929	5.8%
2016	25,864	1,149,019,892	44,425	1.1%
2017	25,794	1,201,925,550	46,597	4.9%
2018	25,864	1,280,302,470	49,501	6.2%
2019	25,825	1,353,266,355	52,401	5.9%

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

Table XII-6
Detailed Active Membership and Salaries as of June 30, 2019

AGE \ SVC	Male Total									
	UNDER 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & UP	ALL YEARS
<i>NUMBER:</i>										
UNDER 20	3	0	0	0	0	0	0	0	0	3
20 TO 24	53	0	0	0	0	0	0	0	0	53
25 TO 29	261	5	0	0	0	0	0	0	0	266
30 TO 34	434	126	13	0	0	0	0	0	0	573
35 TO 39	399	219	80	12	0	0	0	0	0	710
40 TO 44	369	209	160	72	9	0	0	0	0	819
45 TO 49	310	223	230	133	40	8	0	0	0	944
50 TO 54	280	212	212	146	100	46	8	0	0	1,004
55 TO 59	285	210	174	142	135	88	52	5	0	1,091
60 TO 64	149	162	123	128	100	96	68	14	4	844
65 TO 69	52	69	67	49	31	23	17	6	4	318
70 & UP	31	31	37	26	20	10	7	3	7	172
TOTAL	2,626	1,466	1,096	708	435	271	152	28	15	6,797

<i>SALARIES (IN THOUSANDS):</i>										
UNDER 20	115	0	0	0	0	0	0	0	0	115
20 TO 24	1,939	0	0	0	0	0	0	0	0	1,939
25 TO 29	12,469	249	0	0	0	0	0	0	0	12,718
30 TO 34	25,261	7,223	972	0	0	0	0	0	0	33,456
35 TO 39	25,720	13,313	6,522	881	0	0	0	0	0	46,436
40 TO 44	24,082	14,392	14,285	5,604	852	0	0	0	0	59,215
45 TO 49	19,716	14,314	21,264	12,613	3,537	751	0	0	0	72,194
50 TO 54	17,859	12,037	19,786	13,916	9,650	3,861	813	0	0	77,921
55 TO 59	16,903	11,212	14,727	11,773	13,276	8,345	5,269	382	0	81,886
60 TO 64	8,362	8,693	9,919	10,512	8,552	9,346	6,854	1,677	300	64,214
65 TO 69	3,133	3,476	5,244	3,883	2,600	1,889	1,827	771	478	23,301
70 & UP	1,243	999	2,249	1,469	1,948	876	770	338	780	10,672
TOTAL *	156,800	85,908	94,966	60,651	40,416	25,067	15,533	3,169	1,558	484,067

<i>AVERAGE SALARIES: **</i>										
UNDER 20	38,348	0	0	0	0	0	0	0	0	38,348
20 TO 24	36,586	0	0	0	0	0	0	0	0	36,586
25 TO 29	47,775	49,827	0	0	0	0	0	0	0	47,813
30 TO 34	58,205	57,328	74,733	0	0	0	0	0	0	58,387
35 TO 39	64,461	60,792	81,525	73,436	0	0	0	0	0	65,403
40 TO 44	65,262	68,862	89,280	77,836	94,710	0	0	0	0	72,302
45 TO 49	63,599	64,187	92,450	94,832	88,435	93,869	0	0	0	76,477
50 TO 54	63,781	56,778	93,329	95,313	96,504	83,925	101,579	0	0	77,610
55 TO 59	59,308	53,389	84,638	82,908	98,339	94,827	101,325	76,395	0	75,056
60 TO 64	56,119	53,658	80,640	82,122	85,516	97,350	100,801	119,807	75,051	76,083
65 TO 69	60,241	50,373	78,268	79,249	83,875	82,150	107,487	128,543	119,486	73,275
70 & UP	40,093	32,228	60,775	56,509	97,402	87,580	109,979	112,770	111,406	62,045
TOTAL	59,711	58,600	86,648	85,665	92,910	92,498	102,192	113,173	103,866	71,218

Note: Age is nearest birthday. Service is nearest year.

* Total may not add up due to rounding.

** Average based on unrounded salary.

Table XII-6
Detailed Active Membership and Salaries as of June 30, 2019 (cont'd)

AGE \ SVC	Female Total									
	UNDER 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & UP	ALL YEARS
<i>NUMBER:</i>										
UNDER 20	1	0	0	0	0	0	0	0	0	1
20 TO 24	65	0	0	0	0	0	0	0	0	65
25 TO 29	564	14	0	0	0	0	0	0	0	578
30 TO 34	879	202	7	2	0	0	0	0	0	1,090
35 TO 39	902	387	160	21	1	0	0	0	0	1,471
40 TO 44	996	437	346	132	12	0	0	0	0	1,923
45 TO 49	1,033	630	391	231	65	12	1	0	0	2,363
50 TO 54	1,081	872	539	363	140	59	22	1	0	3,077
55 TO 59	879	889	817	604	230	106	41	22	0	3,588
60 TO 64	482	644	712	636	279	131	59	33	4	2,980
65 TO 69	152	275	318	282	161	63	17	14	8	1,290
70 & UP	54	109	146	137	94	33	17	7	5	602
TOTAL	7,088	4,459	3,436	2,408	982	404	157	77	17	19,028

SALARIES (IN THOUSANDS):

UNDER 20	54	0	0	0	0	0	0	0	0	54
20 TO 24	2,566	0	0	0	0	0	0	0	0	2,566
25 TO 29	31,362	704	0	0	0	0	0	0	0	32,066
30 TO 34	51,617	14,148	426	216	0	0	0	0	0	66,408
35 TO 39	46,204	26,594	12,063	1,515	98	0	0	0	0	86,474
40 TO 44	42,772	25,534	26,172	10,018	972	0	0	0	0	105,470
45 TO 49	37,733	29,832	23,296	16,265	5,488	969	101	0	0	113,684
50 TO 54	34,873	34,307	25,869	18,012	9,065	4,511	1,880	117	0	128,635
55 TO 59	27,443	30,899	32,615	26,998	12,898	6,816	2,799	1,657	0	142,124
60 TO 64	15,149	22,540	27,694	27,730	13,793	7,543	4,549	2,596	299	121,893
65 TO 69	4,941	8,704	10,728	11,808	6,865	3,131	1,139	1,087	565	48,969
70 & UP	1,242	3,386	4,319	5,068	3,744	1,510	871	410	305	20,855
TOTAL *	295,959	196,651	163,183	117,630	52,923	24,479	11,339	5,866	1,170	869,199

*AVERAGE SALARIES: ***

UNDER 20	54,345	0	0	0	0	0	0	0	0	54,345
20 TO 24	39,479	0	0	0	0	0	0	0	0	39,479
25 TO 29	55,607	50,272	0	0	0	0	0	0	0	55,478
30 TO 34	58,723	70,041	60,864	108,028	0	0	0	0	0	60,925
35 TO 39	51,224	68,719	75,392	72,129	97,842	0	0	0	0	58,786
40 TO 44	42,944	58,431	75,643	75,894	81,030	0	0	0	0	54,846
45 TO 49	36,528	47,352	59,581	70,410	84,432	80,750	101,493	0	0	48,110
50 TO 54	32,260	39,343	47,995	49,620	64,753	76,459	85,465	116,876	0	41,805
55 TO 59	31,220	34,758	39,920	44,699	56,078	64,301	68,256	75,301	0	39,611
60 TO 64	31,430	35,001	38,896	43,601	49,436	57,579	77,106	78,655	74,798	40,904
65 TO 69	32,509	31,652	33,737	41,871	42,638	49,694	67,012	77,648	70,661	37,960
70 & UP	23,009	31,069	29,583	36,993	39,830	45,745	51,217	58,522	61,061	34,644
TOTAL	41,755	44,102	47,492	48,849	53,893	60,592	72,225	76,180	68,811	45,680

Note: Age is nearest birthday. Service is nearest year.

* Total may not add up due to rounding.

** Average based on unrounded salary.

Table XII-6
Detailed Active Membership and Salaries as of June 30, 2019 (cont'd)

AGE \ SVC	Total									
	UNDER 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & UP	ALL YEARS
<i>NUMBER:</i>										
UNDER 20	4	0	0	0	0	0	0	0	0	4
20 TO 24	118	0	0	0	0	0	0	0	0	118
25 TO 29	825	19	0	0	0	0	0	0	0	844
30 TO 34	1,313	328	20	2	0	0	0	0	0	1,663
35 TO 39	1,301	606	240	33	1	0	0	0	0	2,181
40 TO 44	1,365	646	506	204	21	0	0	0	0	2,742
45 TO 49	1,343	853	621	364	105	20	1	0	0	3,307
50 TO 54	1,361	1,084	751	509	240	105	30	1	0	4,081
55 TO 59	1,164	1,099	991	746	365	194	93	27	0	4,679
60 TO 64	631	806	835	764	379	227	127	47	8	3,824
65 TO 69	204	344	385	331	192	86	34	20	12	1,608
70 & UP	85	140	183	163	114	43	24	10	12	774
TOTAL	9,714	5,925	4,532	3,116	1,417	675	309	105	32	25,825

SALARIES (IN THOUSANDS):

UNDER 20	169	0	0	0	0	0	0	0	0	169
20 TO 24	4,505	0	0	0	0	0	0	0	0	4,505
25 TO 29	43,832	953	0	0	0	0	0	0	0	44,785
30 TO 34	76,878	21,372	1,398	216	0	0	0	0	0	99,864
35 TO 39	71,924	39,908	18,585	2,396	98	0	0	0	0	132,911
40 TO 44	66,854	39,926	40,457	15,622	1,825	0	0	0	0	164,685
45 TO 49	57,449	44,146	44,560	28,877	9,025	1,720	101	0	0	185,878
50 TO 54	52,732	46,344	45,655	31,928	18,716	8,372	2,693	117	0	206,556
55 TO 59	44,346	42,111	47,342	38,771	26,174	15,161	8,067	2,039	0	224,010
60 TO 64	23,511	31,233	37,612	38,242	22,344	16,888	11,404	4,273	599	186,107
65 TO 69	8,074	12,180	15,972	15,691	9,465	5,020	2,966	1,858	1,043	72,270
70 & UP	2,485	4,386	6,568	6,537	5,692	2,385	1,641	748	1,085	31,527
TOTAL *	452,759	282,558	258,149	178,280	93,339	49,546	26,872	9,035	2,728	1,353,266

*AVERAGE SALARIES: ***

UNDER 20	42,347	0	0	0	0	0	0	0	0	42,347
20 TO 24	38,179	0	0	0	0	0	0	0	0	38,179
25 TO 29	53,129	50,155	0	0	0	0	0	0	0	53,062
30 TO 34	58,552	65,158	69,879	108,028	0	0	0	0	0	60,050
35 TO 39	55,284	65,854	77,437	72,604	97,842	0	0	0	0	60,940
40 TO 44	48,977	61,806	79,955	76,580	86,893	0	0	0	0	60,060
45 TO 49	42,776	51,753	71,754	79,334	85,957	85,997	101,493	0	0	56,207
50 TO 54	38,745	42,753	60,792	62,726	77,983	79,729	89,762	116,876	0	50,614
55 TO 59	38,098	38,318	47,772	51,972	71,709	78,148	86,747	75,504	0	47,876
60 TO 64	37,260	38,751	45,045	50,055	58,956	74,398	89,793	90,913	74,924	48,668
65 TO 69	39,578	35,407	41,487	47,404	49,296	58,374	87,249	92,917	86,936	44,944
70 & UP	29,240	31,325	35,890	40,106	49,930	55,474	68,356	74,796	90,429	40,733
TOTAL	46,609	47,689	56,961	57,214	65,871	73,402	86,966	86,045	85,243	52,401

Note: Age is nearest birthday. Service is nearest year.

* Total may not add up due to rounding.

** Average based on unrounded salary.

Table XII-7
Detailed Reconciliation of Active Membership

		TOTAL ACTIVE MEMBERS AS OF JUNE 30, 2019					TOTAL ACTIVE MEMBERS AS OF JUNE 30, 2018				
TIER	GENDER	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC	NUMBER	SALARY	AVG SAL	AVG AGE	AVG SVC
1	M	5	555,561	111,112	72.0	34.4	5	515,323	103,065	71.0	33.8
1	F	11	752,071	68,370	73.8	33.5	14	931,188	66,513	71.3	28.6
		16	1,307,632	81,727	73.3	33.8	19	1,446,511	76,132	71.2	30.0
2	M	9	1,007,590	111,954	69.2	25.0	9	968,131	107,570	68.2	26.4
2	F	6	367,101	61,184	70.2	21.0	12	742,834	61,903	69.2	27.2
		15	1,374,692	91,646	69.6	23.4	21	1,710,965	81,475	68.8	26.9
4	M	4,168	318,954,564	76,525	52.6	14.2	4,515	325,402,960	72,072	51.9	13.6
4	F	12,279	566,596,182	46,144	55.2	12.8	13,735	592,123,090	43,111	54.8	12.2
		16,447	885,550,746	53,843	54.5	13.2	18,250	917,526,050	50,275	54.1	12.5
6	M	2,615	163,549,543	62,543	43.0	2.3	2,073	123,642,985	59,644	42.6	2.1
6	F	6,732	301,483,742	44,784	44.4	2.3	5,501	235,975,959	42,897	44.1	2.1
		9,347	465,033,285	49,752	44.0	2.3	7,574	359,618,944	47,481	43.7	2.1
ALL		25,825	1,353,266,355	52,401	50.8	9.3	25,864	1,280,302,470	49,501	51.1	9.5

MEMBERS WITH SAME GENDER AND TIER IN BOTH VALUATION YEARS							MEMBERS WITH SAME GENDER AND TIER IN BOTH VALUATION YEARS				
1	M	5	555,561	111,112	72.0	34.4	5	515,323	103,065	71.0	33.8
1	F	11	752,071	68,370	73.8	33.5	11	724,647	65,877	72.8	32.8
		16	1,307,632	81,727	73.3	33.8	16	1,239,970	77,498	72.3	33.1
2	M	8	964,123	120,515	69.5	25.2	8	927,185	115,898	68.5	24.1
2	F	6	367,101	61,184	70.2	21.0	6	358,239	59,707	69.2	20.2
		14	1,331,225	95,087	69.8	23.4	14	1,285,424	91,816	68.8	22.4
4	M	4,107	315,201,392	76,747	52.6	14.3	4,107	299,136,519	72,836	51.6	13.5
4	F	12,050	556,720,466	46,201	55.3	12.9	12,050	537,863,242	44,636	54.3	12.2
		16,157	871,921,858	53,966	54.6	13.3	16,157	836,999,761	51,804	53.6	12.5
6	M	1,894	126,894,912	66,998	43.9	2.9	1,894	114,957,636	60,696	42.9	2.1
6	F	4,928	230,778,579	46,830	45.2	2.9	4,928	215,827,671	43,796	44.2	2.1
		6,822	357,673,491	52,429	44.8	2.9	6,822	330,785,307	48,488	43.8	2.1
ALL		23,009	1,232,234,206	53,554	51.7	10.2	23,009	1,170,310,462	50,863	50.7	9.4

ADDITIONS DURING THE YEAR *							SEPARATIONS FROM MEMBERSHIP DURING THE YEAR *				
1	M	0	0	0	0.0	0.0	0	0	0	0.0	0.0
1	F	0	0	0	0.0	0.0	3	206,541	68,847	65.7	13.0
		0	0	0	0.0	0.0	3	206,541	68,847	65.7	13.0
2	M	1	43,467	43,467	67.0	23.3	1	40,946	40,946	66.0	45.0
2	F	0	0	0			6	384,595	64,099	69.2	34.2
		1	43,467	43,467	67.0	23.3	7	425,541	60,792	68.7	35.7
4	M	61	3,753,172	61,527	49.8	9.9	408	26,266,441	64,379	55.6	15.0
4	F	229	9,875,716	43,125	51.2	7.0	1,685	54,259,848	32,202	58.6	12.1
		290	13,628,888	46,996	50.9	7.6	2,093	80,526,289	38,474	58.0	12.6
6	M	721	36,654,631	50,839	40.8	0.6	179	8,685,349	48,522	39.6	2.1
6	F	1,804	70,705,163	39,194	42.4	0.6	573	20,148,288	35,163	43.7	2.0
		2,525	107,359,794	42,519	41.9	0.6	752	28,833,637	38,343	42.7	2.0
ALL		2,816	121,032,149	42,980	42.8	1.3	2,855	109,992,008	38,526	54.0	9.9

Note: Age is nearest birthday. Service is nearest year. The member is considered also present if active with the same tier and gender as of both valuation dates.

* Separations and additions do not include members who joined after June 30, 2018 and are no longer members on June 30, 2019.

Table XII-8
Summary of Non-Pensioner Membership as of June 30, 2019

STATUS	TIER 1		TIER 2		TIER 4		TIER 6		ALL TIERS	
	NUMBER	SALARY	NUMBER	SALARY	NUMBER	SALARY	NUMBER	SALARY	NUMBER	SALARY
<i>MALES:</i>										
ACTIVES	5	555,561	9	1,007,590	4,168	318,954,564	2,615	163,549,543	6,797	484,067,258
ACTIVE OFF PAYROLL ²	0	0	0	0	480	21,047,114	243	11,552,143	723	32,599,257
VESTED	0	0	4	83,294	647	19,368,972	0	0	651	19,452,266
ALL STATUS	5	555,561	13	1,090,884	5,295	359,370,650	2,858	175,101,686	8,171	536,118,781
<i>FEMALES:</i>										
ACTIVES	11	752,071	6	367,101	12,279	566,596,182	6,732	301,483,742	19,028	869,199,097
ACTIVE OFF PAYROLL ²	0	0	1	15,083	1,896	61,184,149	801	27,847,804	2,698	89,047,036
VESTED	1	5,000	3	59,009	1,363	35,847,613	1	19,858	1,368	35,931,480
ALL STATUS	12	757,071	10	441,193	15,538	663,627,944	7,534	329,351,404	23,094	994,177,613
<i>TOTAL:</i>										
ACTIVES	16	1,307,632	15	1,374,692	16,447	885,550,746	9,347	465,033,285	25,825	1,353,266,355
ACTIVE OFF PAYROLL ²	0	0	1	15,083	2,376	82,231,263	1,044	39,399,947	3,421	121,646,293
VESTED	1	5,000	7	142,303	2,010	55,216,585	1	19,858	2,019	55,383,746
ALL STATUS	17	1,312,632	23	1,532,078	20,833	1,022,998,594	10,392	504,453,090	31,265	1,530,296,394

¹ Salary shown for Active Off Payroll and Vested members is the salary when last active and has been assumed to be \$5,000 where unavailable.

² This table does not include members who are not vested and have either withdrawn or been off payroll for 5 years, and therefore are solely eligible to receive a refund of their member contributions. There are 8,001 such members who are otherwise included in the active off payroll category elsewhere in the report.

Table XII-9
Summary of Pensioner Membership

Group	June 30, 2019 (Lag)					June 30, 2018 (Lag)				
	Number	Annual Amounts Payable				Number	Annual Amounts Payable			
		Fixed	Variable	Supplement	Total		Fixed	Variable	Supplement	Total
Service Pensioners	16,156	\$ 220,965,724	\$ 1,860,933	\$ 12,954,464	\$ 235,781,121	15,979	\$ 210,997,333	\$ 2,000,755	\$ 12,911,634	\$ 225,909,722
Ordinary Disability Pensioners	1,136	13,195,357	22,213	786,739	14,004,309	1,085	12,560,802	10,362	719,878	13,291,042
Accidental Disability Pensioners	223	2,480,690	0	269,706	2,750,396	209	2,373,753	0	268,389	2,642,142
Accidental Death Pensioners	2	5,696	0	0	5,696	2	5,696	0	9,899	15,595
Other Beneficiaries	985	13,155,580	303,207	1,161,524	14,620,311	766	10,282,715	247,111	1,033,274	11,563,100
Total	18,502	\$ 249,803,047	\$ 2,186,353	\$ 15,172,433	\$ 267,161,833	18,041	\$ 236,220,299	\$ 2,258,229	\$ 14,943,074	\$ 253,421,602

Table XII-10
Distribution of Pension Benefits by Cause and Age as of June 30, 2019

AGE	MALE			FEMALE			TOTAL		
	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE
<i>SERVICE RETIREMENT:</i>									
UNDER 30	0	0	0	0	0	0	0	0	0
30 TO 34	0	0	0	0	0	0	0	0	0
35 TO 39	0	0	0	0	0	0	0	0	0
40 TO 44	0	0	0	0	0	0	0	0	0
45 TO 49	0	0	0	1	2,522	2,522	1	2,522	2,522
50 TO 54	6	350,369	58,395	2	35,091	17,546	8	385,460	48,183
55 TO 59	83	3,074,208	37,039	205	2,323,574	11,335	288	5,397,782	18,742
60 TO 64	307	10,374,917	33,795	1,140	14,425,746	12,654	1,447	24,800,663	17,139
65 TO 69	663	22,012,898	33,202	2,635	34,163,699	12,965	3,298	56,176,597	17,034
70 TO 74	671	19,350,907	28,839	2,958	33,659,304	11,379	3,629	53,010,211	14,607
75 TO 79	545	15,666,849	28,747	2,430	26,099,085	10,740	2,975	41,765,934	14,039
80 TO 84	393	11,214,964	28,537	1,652	14,898,111	9,018	2,045	26,113,075	12,769
85 TO 89	240	6,201,688	25,840	1,111	9,970,661	8,974	1,351	16,172,349	11,971
90 & UP	168	4,105,303	24,436	946	7,851,225	8,299	1,114	11,956,528	10,733
TOTAL	3,076	92,352,103	30,023	13,080	143,429,018	10,966	16,156	235,781,121	14,594
<i>ORDINARY DISABILITY:</i>									
UNDER 30	0	0	0	0	0	0	0	0	0
30 TO 34	0	0	0	0	0	0	0	0	0
35 TO 39	0	0	0	0	0	0	0	0	0
40 TO 44	2	40,531	20,266	1	28,251	28,251	3	68,782	22,927
45 TO 49	6	85,609	14,268	9	140,450	15,606	15	226,059	15,071
50 TO 54	12	190,703	15,892	35	479,903	13,712	47	670,606	14,268
55 TO 59	37	676,163	18,275	117	1,399,491	11,961	154	2,075,654	13,478
60 TO 64	62	1,158,259	18,682	190	2,083,546	10,966	252	3,241,805	12,864
65 TO 69	52	875,569	16,838	194	2,188,976	11,283	246	3,064,545	12,458
70 TO 74	37	607,139	16,409	178	1,817,029	10,208	215	2,424,168	11,275
75 TO 79	25	398,924	15,957	105	1,020,697	9,721	130	1,419,621	10,920
80 TO 84	11	162,249	14,750	37	350,691	9,478	48	512,940	10,686
85 TO 89	3	69,042	23,014	11	83,890	7,626	14	152,932	10,924
90 & UP	7	109,537	15,648	5	37,660	7,532	12	147,197	12,266
TOTAL	254	4,373,725	17,219	882	9,630,584	10,919	1,136	14,004,309	12,328
<i>ACCIDENTAL DISABILITY:</i>									
UNDER 30	0	0	0	0	0	0	0	0	0
30 TO 34	0	0	0	0	0	0	0	0	0
35 TO 39	0	0	0	1	23,879	23,879	1	23,879	23,879
40 TO 44	0	0	0	1	9,470	9,470	1	9,470	9,470
45 TO 49	1	11,956	11,956	3	31,449	10,483	4	43,405	10,851
50 TO 54	1	10,250	10,250	4	36,939	9,235	5	47,189	9,438
55 TO 59	9	194,279	21,587	18	188,510	10,473	27	382,789	14,177
60 TO 64	7	160,610	22,944	36	369,885	10,275	43	530,495	12,337
65 TO 69	13	183,642	14,126	40	452,523	11,313	53	636,165	12,003
70 TO 74	8	149,743	18,718	25	218,423	8,737	33	368,166	11,157
75 TO 79	4	67,619	16,905	19	148,533	7,818	23	216,152	9,398
80 TO 84	6	183,427	30,571	11	87,558	7,960	17	270,985	15,940
85 TO 89	0	0	0	7	44,383	6,340	7	44,383	6,340
90 & UP	5	139,507	27,901	4	37,811	9,453	9	177,318	19,702
TOTAL	54	1,101,033	20,390	169	1,649,363	9,760	223	2,750,396	12,334

Table XII-10
Distribution of Pension Benefits by Cause and Age as of June 30, 2019 (cont'd)

AGE	MALE			FEMALE			TOTAL		
	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE	NUMBER	BENEFITS	AVERAGE
<i>ACCIDENTAL DEATH:</i>									
UNDER 30	0	0	0	0	0	0	0	0	0
30 TO 34	0	0	0	0	0	0	0	0	0
35 TO 39	0	0	0	0	0	0	0	0	0
40 TO 44	0	0	0	0	0	0	0	0	0
45 TO 49	0	0	0	0	0	0	0	0	0
50 TO 54	0	0	0	0	0	0	0	0	0
55 TO 59	0	0	0	0	0	0	0	0	0
60 TO 64	1	5,299	5,299	0	0	0	1	5,299	5,299
65 TO 69	0	0	0	0	0	0	0	0	0
70 TO 74	0	0	0	0	0	0	0	0	0
75 TO 79	0	0	0	0	0	0	0	0	0
80 TO 84	1	397	397	0	0	0	1	397	397
85 TO 89	0	0	0	0	0	0	0	0	0
90 & UP	0	0	0	0	0	0	0	0	0
TOTAL	2	5,696	2,848	0	0	0	2	5,696	2,848
<i>OTHER BENEFICIARIES:</i>									
UNDER 30	4	22,754	5,689	3	23,460	7,820	7	46,214	6,602
30 TO 34	8	57,309	7,164	1	5,856	5,856	9	63,165	7,018
35 TO 39	5	82,773	16,555	5	32,556	6,511	10	115,329	11,533
40 TO 44	4	41,490	10,373	13	135,174	10,398	17	176,664	10,392
45 TO 49	11	106,556	9,687	18	220,431	12,246	29	326,987	11,275
50 TO 54	9	38,112	4,235	36	194,248	5,396	45	232,360	5,164
55 TO 59	17	128,239	7,543	43	296,411	6,893	60	424,650	7,078
60 TO 64	33	350,228	10,613	41	479,608	11,698	74	829,836	11,214
65 TO 69	24	400,121	16,672	66	926,637	14,040	90	1,326,758	14,742
70 TO 74	56	1,007,601	17,993	72	1,046,854	14,540	128	2,054,455	16,050
75 TO 79	49	656,550	13,399	81	1,656,079	20,445	130	2,312,629	17,789
80 TO 84	37	478,694	12,938	97	1,974,511	20,356	134	2,453,205	18,308
85 TO 89	30	466,938	15,565	99	1,809,957	18,282	129	2,276,895	17,650
90 & UP	23	292,384	12,712	100	1,688,780	16,888	123	1,981,164	16,107
TOTAL	310	4,129,749	13,322	675	10,490,562	15,542	985	14,620,311	14,843
<i>ALL PENSIONERS AND BENEFICIARIES:</i>									
UNDER 30	4	22,754	5,689	3	23,460	7,820	7	46,214	6,602
30 TO 34	8	57,309	7,164	1	5,856	5,856	9	63,165	7,018
35 TO 39	5	82,773	16,555	6	56,435	9,406	11	139,208	12,655
40 TO 44	6	82,021	13,670	15	172,895	11,526	21	254,916	12,139
45 TO 49	18	204,121	11,340	31	394,852	12,737	49	598,973	12,224
50 TO 54	28	589,434	21,051	77	746,181	9,691	105	1,335,615	12,720
55 TO 59	146	4,072,889	27,897	383	4,207,986	10,987	529	8,280,875	15,654
60 TO 64	410	12,049,313	29,389	1,407	17,358,785	12,337	1,817	29,408,098	16,185
65 TO 69	752	23,472,230	31,213	2,935	37,731,835	12,856	3,687	61,204,065	16,600
70 TO 74	772	21,115,390	27,352	3,233	36,741,610	11,365	4,005	57,857,000	14,446
75 TO 79	623	16,789,942	26,950	2,635	28,924,394	10,977	3,258	45,714,336	14,031
80 TO 84	448	12,039,731	26,874	1,797	17,310,871	9,633	2,245	29,350,602	13,074
85 TO 89	273	6,737,668	24,680	1,228	11,908,891	9,698	1,501	18,646,559	12,423
90 & UP	203	4,646,731	22,890	1,055	9,615,476	9,114	1,258	14,262,207	11,337
TOTAL	3,696	101,962,306	27,587	14,806	165,199,527	11,158	18,502	267,161,833	14,440

Graph XII-11
Pensioner Average Benefits

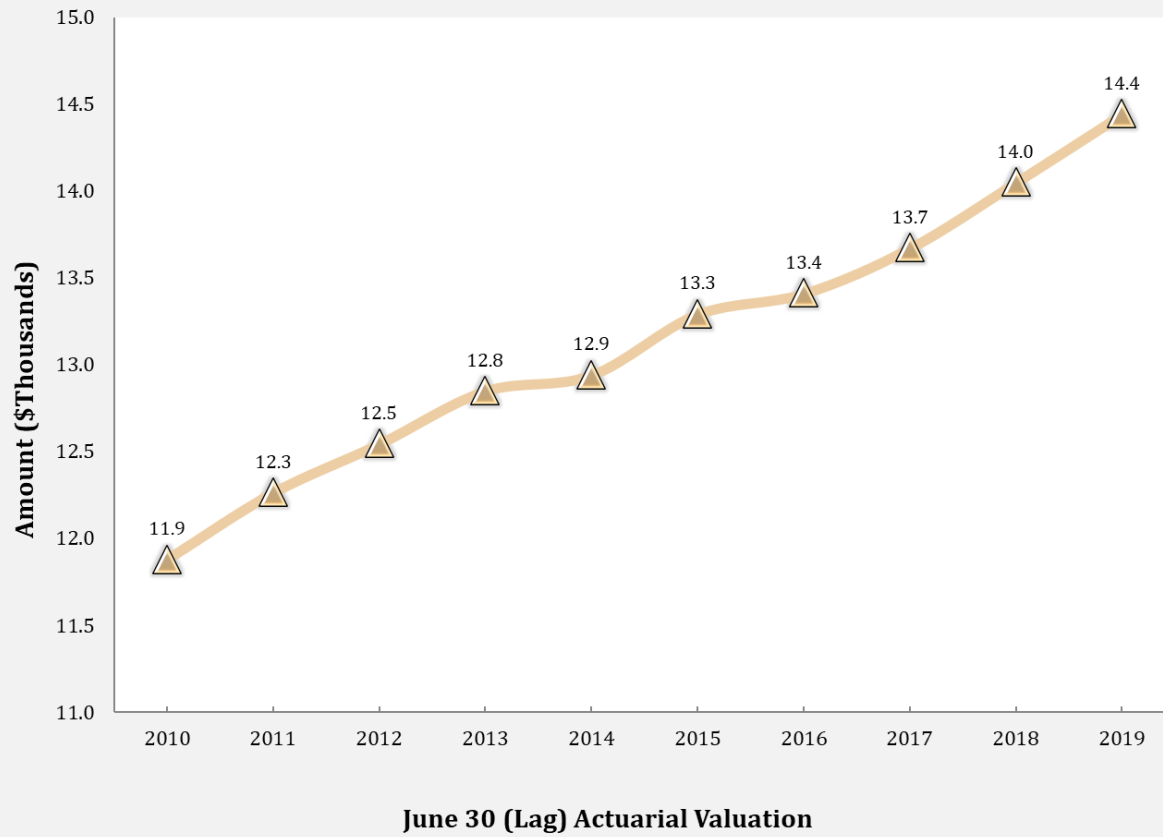


Table XII-12
Reconciliation of Pensioner and Beneficiary Data

SCHEDULE OF PENSIONERS AND BENEFICIARIES ADDED TO AND REMOVED FROM THE ROLLS								
June 30 (Lag) Actuarial Valuation	Added to Rolls		Removed from Rolls		End of Year Rolls		% Increase in Annual Allowances	Average Annual Allowances
	Number	Annual Allowances ¹	Number	Annual Allowances	Number	Annual Allowances		
2010	850	10,705,737	522	4,700,094	13,969	165,871,253	3.8%	11,874
2011	901	14,977,636	471	4,325,573	14,399	176,523,316	6.4%	12,259
2012	1,053	16,201,746	578	6,211,198	14,874	186,513,864	5.7%	12,540
2013	1,110	16,977,455	529	4,957,022	15,455	198,534,297	6.4%	12,846
2014	1,094	13,701,890	554	5,306,812	15,995	206,929,375	4.2%	12,937
2015	1,002	16,482,509	559	4,979,621	16,438	218,432,263	5.6%	13,288
2016	1,075	14,412,852	576	5,776,541	16,937	227,068,574	4.0%	13,407
2017	1,061	17,321,922	573	6,234,174	17,425	238,156,322	4.9%	13,668
2018	1,179	20,878,837	563	5,613,557	18,041	253,421,602	6.4%	14,047
2019	1,216	22,617,426	755	8,877,195	18,502	267,161,833	5.4%	14,440

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

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

APPENDIX: ACRONYMS AND ABBREVIATIONS

Revised 2021 A&M	Actuarial Assumptions and Methods with changes proposed by the Actuary and adopted by the Board of Trustees during Fiscal Year 2021
2019 A&M	Actuarial Assumptions and Methods with changes proposed by the Actuary and adopted by the Board of Trustees during Fiscal Year 2019
AAVM	Actuarial Asset Valuation Method
ACCNYS	Administrative Code of the City of New York
AIR	Actuarial Interest Rate
AL	Accrued Liability
AMC	Additional Member Contributions
AMC-PT	Additional Member Contributions for Physically-Taxing employment
AVR	Asset Volatility Ratio
AVA	Actuarial Value of Assets
BERS	New York City Board of Education Retirement System
BMC	Basic Member Contributions
COLA	Cost-of-Living Adjustment
EAN	Entry Age Normal cost method
EIR	Expected Investment Return
FAS	Final Average Salary
FS	Final Salary
GASB	Governmental Accounting Standards Board
GASB25	Governmental Accounting Standards Board Statement No. 25
GASB67	Governmental Accounting Standards Board Statement No. 67
GASB68	Governmental Accounting Standards Board Statement No. 68
IRC	Internal Revenue Code
MVA	Market Value of Assets
OYLM	One-Year Lag Methodology
PT	Physically-Taxing Employment
PV	Present Value
PVFB	Present Value of Future Benefits
PVFNC	Present Value of Future Normal Costs
PVFS	Present Value of Future Salary
TDA	Tax-Deferred Annuity Program
UAL	Unfunded Accrued Liability
UIR	Unexpected Investment Return
WTC	World Trade Center