



Teachers' Retirement System of the State of Illinois

**Actuarial Valuation and Review of
Pension Benefits as of June 30, 2018**

January 11, 2019



101 NORTH WACKER DRIVE, SUITE 500 CHICAGO, IL 60606
T 312.984.8500 F 312.984.8590 www.segalco.com

January 11, 2019

Board of Trustees
Teachers' Retirement System of the State of Illinois
2815 West Washington Street
Springfield, Illinois 62702

Ladies and Gentlemen:

This report presents the results of the annual valuation of the assets and liabilities of the Teachers' Retirement System of the State of Illinois (TRS or System) as of June 30, 2018, prepared in accordance with the funding policy specified under the Illinois Pension Code (40 ILCS 5/16). This valuation takes into account all of the pension benefits to which members are entitled.

Actuarial Assumptions and Methods

The valuation was based on the actuarial assumptions adopted by the Board of Trustees, reflecting the three-year demographic and economic experience review covering the period July 1, 2014, through June 30, 2017, presented at the August 2018 Board meeting. In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the System and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience of the System. The methods mandated by the Illinois Pension Code as described in the Funding Adequacy section are inadequate to appropriately fund TRS.

Assets and Membership Data

TRS reported to the actuary the individual data for members of the System as of the prior valuation date. Valuation results are projected, based upon the actuarial assumptions, to account for the one-year difference between the date of the census data and the valuation date. The amount of assets in the trust fund as of the valuation date was based on statements prepared by TRS.

Funding Adequacy

The member and employer contribution rates are determined in accordance with the funding policy specified under the Illinois Pension Code (40 ILCS 5/16). The member contribution rate is 9.0%, which is comprised of 7.5% toward the cost of the retirement annuity, 0.5% toward the cost of the automatic annual increase in the retirement annuity, and 1.0% for survivor benefits. The employer contributions are determined such that, together with the member contributions, the plan is projected to achieve 90% funding by 2045. The 2045 funding objective of 90% was set in 1994 as a 50-year objective. TRS members have always contributed their share. **The State funding has been inadequate, resulting in TRS being among the worst funded public employee retirement systems in the United States. We strongly recommend an actuarial funding method that targets 100% funding. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial**

accrued liability, and the principal balance. The funding policy adopted by the Board, referred to as the Board-Adopted Actuarial Funding Policy, meets this standard.

The valuation indicates that for the fiscal year ending June 30, 2018, the actuarial experience of TRS was unfavorable, generating a net actuarial loss of \$1,035 million (0.8% of the actuarial accrued liability). This loss is the net result of a \$307 million gain due to favorable investment return experience and a \$1,342 million net loss due to demographic experience for fiscal 2018.


Actuarial Certification

In preparing the results presented in this report, we have relied upon information TRS staff provided to us regarding the benefit provisions, System members, benefit payments and unaudited plan assets. While the scope of our engagement did not call for us to perform an audit or independent verification of this information, we have reviewed this information for reasonableness. The accuracy of the results presented in this report is dependent upon the accuracy and completeness of the underlying information.


In our opinion, the results presented comply with the Illinois Pension Code and, where applicable, the Internal Revenue Code, and the Statements of the Governmental Accounting Standards Board. While all calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board, this does not endorse the funding methodology required by the Illinois Pension Code. The undersigned are independent actuaries. They are Fellows of the Society of Actuaries, Enrolled Actuaries, and Members of the American Academy of Actuaries, and are experienced in performing valuations for large public retirement systems. They meet the Qualification Standards of the American Academy of Actuaries.

Respectfully submitted,

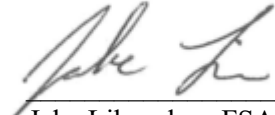
Segal Consulting, a Member of the Segal Group

By: 

Kim Nicholl, FSA, MAAA, EA
Senior Vice President and Actuary



Matthew A. Strom, FSA, MAAA, EA
Vice President and Actuary



Jake Libauskas, FSA, MAAA, EA
Consulting Actuary

SECTION 1

VALUATION SUMMARY

Overview of TRS	1
Significant Results of the Actuarial Valuation	2
Summary of Key Valuation Results	5
Significant Issues Facing TRS....	7
Sensitivity Projections	15
Important Information about Actuarial Valuations	17

SECTION 2

VALUATION RESULTS

A. Member Data.....	19
B. Financial Information.....	23
C. Actuarial Experience	26
D. Development of Employer Contributions.....	31
E. Risk	33

SECTION 3

SUPPLEMENTAL INFORMATION

EXHIBIT A – Summary of Membership Data	35
EXHIBIT B – Active Membership Data as of June 30, 2017 – Number and Average Annual Salary.....	38
EXHIBIT C – 10-Year History of Active Membership Data	39
EXHIBIT D – History of Active Membership Data by Tier	40
EXHIBIT E – 10-Year History of Annuitant and Survivor Annuitant Membership.....	41
EXHIBIT F – Benefit Stream for Guaranteed Minimum Annuity Reserve.....	42
EXHIBIT G – Reconciliation of Member Data.....	43
EXHIBIT H – Summary Statement of Income and Expenses on a Market Value Basis.....	44
EXHIBIT I – Summary Statement of System Assets	45
EXHIBIT J – History of System Revenue and Expenses	46
EXHIBIT K – Development of Unfunded Actuarial Accrued Liability.....	47

SECTION 4

REPORTING INFORMATION

EXHIBIT I Derivation of Employer Contributions under Illinois Pension Code	48
EXHIBIT II Development of State and Federal Funds Statutory Contributions under Illinois Pension Code.....	51
EXHIBIT III Development of State and Federal Funds Contributions Based on Board-Adopted Actuarial Funding Policy.....	53
EXHIBIT IV Unfunded Liability Bases	54
EXHIBIT V Components of Phase-in of the Effect of Assumption Changes	55
EXHIBIT VI 10-Year History of Unfunded Actuarial Liability and Funded Ratio	56
EXHIBIT VII Funded Ratio	57
EXHIBIT VIII Department of Insurance Information.....	58
EXHIBIT IX Roll Forward of Actuarial Accrued Liability and Normal Cost	59

SECTION 4

REPORTING INFORMATION (CONTINUED)

EXHIBIT X State’s Share of the Contribution to TRS Necessary to Fund Normal Cost Plus Interest on the Unfunded Actuarial Accrued Liability	60
EXHIBIT XI Development of Actuarially Determined Contribution.....	61

SECTION 5

PROJECTIONS

Overview.....	62
TABLE 1 Projection of Funded Ratio to 2046	63
TABLE 2 Projection of Contributions to Trust to 2046	65
TABLE 3 Projection of Contributions to Trust to 2046 (Percent of Payroll).....	68
TABLE 4 Projection of Employer Normal Cost and Amortization Amount to 2046	70
TABLE 5 Projection of Funded Ratio to 2046 by Tier.....	74
TABLE 6 Projection of Actuarial Accrued Liability to 2046 by Member Group	78
TABLE 7 Projection of Total Normal Cost to 2046 by Member Group.....	79
TABLE 8 Projection of Benefit Payments to 2046 by Member Group.....	80

SECTION 5

PROJECTIONS (CONTINUED)

TABLE 9 Projection of Payroll to 2046 by Member Group.....	81
TABLE 10 Projection of Member Count to 2046 by Member Group.....	82
TABLE 11 Projection of Employer Normal Cost to 2046 by Member Group	83
TABLE 12 Projection of Debt Service to 2033	84

SECTION 6

GASB INFORMATION

EXHIBIT 1 Schedule of Employer Contributions	85
EXHIBIT 2 Schedule of Funding Progress ..	87
EXHIBIT 3 Solvency Test	88
EXHIBIT 4 Net Pension Liability.....	89
EXHIBIT 5 Schedules of Changes in Net Pension Liability.....	91
EXHIBIT 6 Reconciliation of Collective Net Pension Liability.....	92
EXHIBIT 7 Collective Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions.....	93
EXHIBIT 8 Collective Pension Expense	95
EXHIBIT 9 Development of Blended Discount Rate	96

SECTION 7

ASSUMPTIONS, BENEFIT PROVISIONS AND DEFINITIONS

Summary of Assumptions and Methods.....	102
Summary of Plan Provisions..	110
Definitions of Terms	119
History of Legislative Changes	125

SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

OVERVIEW OF TRS

The Teachers' Retirement System of the State of Illinois (TRS) was established by the State of Illinois on July 1, 1939, to provide retirement, disability, and death benefits to teachers employed by Illinois public elementary and secondary schools outside the City of Chicago. TRS is the administrator of a cost-sharing, multiple-employer defined benefit public employee retirement system. Membership is mandatory for all full-time, part-time, and substitute public school personnel employed outside of Chicago in positions requiring certification. Persons employed at certain state agencies are also members. TRS is governed by the Illinois Pension Code (40 ILCS 5/16).

Members of TRS are employed by school districts, special districts, and certain state agencies. As of June 30, 2018, there were 990 employers, comprised of 851 local school districts, 127 special districts, and 12 state agencies. The membership totaled over 420,000 members as of June 30, 2017. Of the 420,000 members, 120,000 are retirees and survivors to whom TRS paid over \$6.5 billion during the fiscal year ending June 30, 2018. As of June 30, 2018, the assets of TRS amounted to \$52.0 billion on a market value basis.

The amount of the benefit paid to a member upon retirement, termination, disability, or death is defined by the Illinois Pension Code (40 ILCS 5/16). The contributions to fund these benefits are determined through an annual valuation based upon the funding provisions in the Illinois Pension Code (40 ILCS 5/16).

PURPOSE OF THE ANNUAL ACTUARIAL VALUATION

An actuarial valuation is performed annually as of June 30. The purposes of the annual actuarial valuation are to:

- Calculate the annual contribution as required by the Illinois Pension Code. This contribution is not adequate to fund TRS.
- Calculate an actuarially determined contribution based upon the funding policy adopted by the Board. This contribution, if paid, would be expected to adequately fund TRS.
- Determine the funding progress under the Illinois Pension Code's inadequate funding standard.
- Determine the annual gain and loss amounts by source.
- Satisfy regulatory and accounting requirements.

SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

SIGNIFICANT RESULTS OF THE ACTUARIAL VALUATION

1. The contribution made during fiscal 2018 by the State, as required by the Illinois Pension Code, was insufficient to reduce the unfunded actuarial accrued liability.
2. The following assumption changes were approved by the Board on August 17, 2018, and are reflected in this valuation:
 - a. The rates of individual salary increase were increased based on plan experience.
 - b. The assumed average severance payment was increased from 2.5% to 10.0% of other pensionable earnings in the last year of employment.
 - c. The termination rates were decreased based on plan experience.
 - d. The disability rates were decreased based on plan experience.
 - e. The retirement rates for active Tier I members were adjusted based on plan experience. The previous service groups of 19 to 30 years of service and 31 years of service were updated to 19 to 29 years of service and 30 to 31 years of service, respectively.
 - f. The healthy, disabled, and beneficiary post-retirement mortality assumptions were updated to use adjusted rate multipliers at various ages for males and females to better reflect recent plan experience.
 - g. The mortality improvement scale was updated from Scale MP-2014 to Scale MP-2017.
 - h. The sick leave service credit rates were adjusted based on plan experience.
 - i. The optional service purchase rates were adjusted based on plan experience.
3. Public Act 100-0587, enacted on June 4, 2018, created two new buyout provisions for TRS members: an inactive vested buyout and an automatic annual increase buyout, which will exist until June 30, 2021.

The inactive vested buyout provision gives inactive vested members an option to receive an immediate lump sum in exchange for their annuity at retirement. The lump sum would be equal to 60% of the present value of future benefits.

The automatic annual increase buyout provision gives Tier I members the option to receive a lump sum at retirement in exchange for having their automatic annual increase based on 1.5% of the originally granted annuity effective at the later of January 1 following age 67 or the first anniversary of retirement. The lump sum would be equal to 70% of the difference between the present value of benefits based on the Tier I automatic annual increase and the 1.5% automatic annual increase of the originally granted annuity.

Using the same assumptions as the Illinois legislation, 22% of eligible inactive vested members are assumed to elect the inactive vested buyout and 25% of eligible retiring Tier 1 members are assumed to elect the automatic annual increase

SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

buyout. These assumptions may be revised in the future as experience emerges, which would affect the FY 2019 recertification.

4. Public Act 100-0587 also revised the so-called "FAS Cap" threshold from 6% to 3%. That is, if a teacher's salary increases by more than 3% and that salary is used to determine final average salary, the employer must now pay for the cost of benefits due to the salary increase above 3% (previously above 6%).
5. The total projected employer contribution for 2020, including State, Federal, and School Districts, is \$4.93 billion. Of this amount, \$1.17 billion, or about 24%, is for the employer portion of the normal cost and \$3.76 billion, or about 76%, is for unfunded actuarial accrued liability. The required State contribution for 2020 is \$4.81 billion, an increase from \$4.35 billion for 2019 (based on a preliminary recertification reflecting Public Act 100-0587).
6. The funded ratio based on the actuarial value of assets over the actuarial accrued liability as of June 30, 2018, was 40.7%, compared to 40.2% as of June 30, 2017. This ratio is a measure of funded status, and its history is a measure of funding progress.
7. For the year ended June 30, 2018, Segal has estimated that the asset return on a market value basis was 8.32%. After gradual recognition of previous investment gains and losses under the actuarial smoothing method, the actuarial rate of return was 7.63%. This represents an experience gain when compared to the assumed rate of 7.00%. As of June 30, 2018, the actuarial value of assets (\$51.7 billion) represented 99.5% of the market value (\$52.0 billion).
8. The investment gain on the actuarial value of assets for the year ended June 30, 2018, was \$307 million. The demographic and liability experience resulted in a \$1,342 million loss (1.1% of actuarial accrued liability), largely due to unfavorable retirement experience.
9. As page 23 of this report indicates, the total investment gain not yet recognized as of June 30, 2018, is \$239 million. These unrecognized gains will be recognized in the determination of the actuarial value of assets for funding purposes in the next few years, to the extent they are not offset by recognition of losses derived from future experience. This means that earning the assumed rate of investment return of 7.00% per year (net of investment expenses) on a market value basis will result in investment gains on the actuarial value of assets in the next few years.
10. As mentioned above, the current method used to determine the actuarial value of assets yields an amount that is 99.5% of the market value of assets as of June 30, 2018. Guidelines in Actuarial Standard of Practice No. 44 (Selection and Use of Asset Valuation Methods for Pension Valuations) recommend that asset values fall within a reasonable range around the corresponding market value. The actuarial asset method complies with this guideline.

SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

11. The System's cash flow (contributions minus benefit payments, refunds, and expenses) as a percentage of the market value of assets was -2.8% as of June 30, 2018, and remained unchanged from the prior year. Negative cash flow drains the assets of the System without investment income and may cause suboptimal investment strategies.
12. This actuarial valuation report as of June 30, 2018, is based on financial data as of that date. Changes in the value of assets subsequent to that date are not reflected.
13. The GASB net pension liability (NPL) is equal to the difference between the TPL and the Plan's fiduciary net position. The NPL increased from \$76.4 billion as of June 30, 2017, to \$77.9 billion as of June 30, 2018. This is a result of the contributions required by the Illinois Pension Code being insufficient to reduce the NPL.

SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

Summary of Key Valuation Results

	June 30, 2018		June 30, 2017
	Before Assumption Changes	After Assumption Changes	
Present Value of Future Benefits:			
1. Active members	\$59,919,160,824	\$62,948,473,760	\$57,910,369,349
2. Retired members and beneficiaries receiving benefits	84,147,245,467	82,968,464,565	80,882,352,665
3. Inactive members with deferred benefits	<u>3,198,937,192</u>	<u>3,161,375,282</u>	<u>3,402,129,006</u>
4. Total: (1) + (2) + (3)	\$147,265,343,483	\$149,078,313,607	\$142,194,851,020
Actuarial Accrued Liability:			
1. Active members	\$40,384,833,928	\$40,889,490,317	\$38,619,552,597
2. Retired members and beneficiaries receiving benefits	84,147,246,467	82,968,464,565	80,882,352,665
3. Inactive members with deferred benefits	<u>3,198,937,192</u>	<u>3,161,375,282</u>	<u>3,402,129,006</u>
4. Total: (1) + (2) + (3)	\$127,731,016,587	\$127,019,330,164	\$122,904,034,268
Funded Status:			
1. Actuarial accrued liability	\$127,731,016,587	\$127,019,330,164	\$122,904,034,268
2. Actuarial value of assets (AVA)	<u>51,730,889,960</u>	<u>51,730,889,960</u>	<u>49,467,525,209</u>
3. Unfunded actuarial accrued liability (AVA basis): (1) – (2)	\$76,000,126,627	\$75,288,440,204	\$73,436,509,059
4. Funded ratio (AVA basis): (2) / (1)	40.5%	40.7%	40.2%
5. Market value of assets (MVA)	\$51,969,546,694	\$51,969,546,694	\$49,375,664,518
6. Unfunded actuarial accrued liability (MVA basis): (1) – (5)	75,761,469,893	75,049,783,470	73,528,369,750
7. Funded ratio (MVA basis): (5) / (1)	40.7%	40.9%	40.2%
Summary of State Contributions for Fiscal Year*:			
		2020	2019
1. Based on Statutory Funding Plan		\$4,813,577,696	\$4,353,923,925
2. Based on Board-Adopted Actuarial Funding Policy		7,878,670,709	7,340,352,601
3. Difference between Board-Adopted Actuarial Funding Policy and Statutory Funding: (2) – (1)		\$3,065,093,013	\$2,986,428,676
4. Normal cost rate based on Statutory Funding Plan			
(a) Total (including administrative expenses)		19.66%	18.85%
(b) Member rate		<u>9.00%</u>	<u>9.00%</u>
(c) Employer: (4a) – (4b)		10.66%	9.85%

*The State contributions for FY2019 have been preliminarily revised to reflect the funding and benefit provisions of Public Act 100-0587.

SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

Summary of Key Valuation Results (continued)

	June 30, 2018	June 30, 2017
Summary of State Contributions for Fiscal Year (continued):	2020	2019
5. Total normal cost based on Statutory Funding Plan		
(a) Total	\$2,124,293,223	\$1,980,277,506
(b) Administrative expenses	28,833,052	27,496,337
(c) Expected member contributions	<u>985,912,521</u>	<u>958,472,559</u>
(d) Total employer normal cost: (5a) + (5b) – (5c)	\$1,167,213,754	\$1,049,301,284
GASB information:		
1. Long-term expected rate of return	7.00%	7.00%
2. Municipal bond index*	3.87%	3.58%
3. Single equivalent discount rate	7.00%	7.00%
4. Total pension liability	\$129,914,383,296	\$125,773,806,438
5. Plan fiduciary net position	<u>51,969,546,694</u>	<u>49,375,664,518</u>
6. Net pension liability: (4) – (5)	\$77,944,836,602	\$76,398,141,920
7. Plan fiduciary net position as a percentage of total pension liability: (5) / (4)	40.0%	39.3%
Demographic data used for valuation as of June 30**:	2017	2016
1. Number of active member		
(a) Full-time and regular part-time	133,761	133,505
(b) Substitute, part-time, and hourly paid	<u>26,664</u>	<u>26,080</u>
(c) Total	160,425	159,585
2. Number of inactive member		
(a) Eligible for deferred annuities	19,531	19,038
(b) Eligible for refunds or single sum benefits only	119,738	117,817
3. Number of annuitants	<u>120,453</u>	<u>117,990</u>
4. Total membership: (1c) + (2a) + (2b) + (3)	420,147	414,430
5. Annual salaries		
(a) Full-time and regular part-time	\$9,610,001,605	\$9,450,737,426
(b) Substitute, part-time, and hourly paid	<u>152,390,955</u>	<u>154,723,494</u>
(c) Total	\$9,762,392,560	\$9,605,460,920
6. Annual annuities	\$6,336,471,817	\$6,033,050,890

* Bond Buyer's 20-Bond GO index.

** Member data used in the valuation is as of the prior valuation date.

SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

SIGNIFICANT ISSUES FACING TRS

Funding Policy

A funding policy outlines the parameters for calculating an actuarially determined contribution rate and ensures the systematic funding of future benefit payments. An actuarially determined contribution is comprised of the Normal Cost and an amortization of the Unfunded Actuarial Accrued Liability. These amounts are determined by the following three funding policy components:

- *Actuarial Cost Method:* The Actuarial Cost Method allocates the total present value of future benefits to each year (Normal Cost) including all past years (Actuarial Accrued Liability or AAL)
- *Asset Smoothing Method:* The techniques that spread the recognition of investment gains or losses over a period of time for the purposes of determining the Actuarial Value of Assets used in the actuarial valuation
- *Amortization Policy:* The method on how, in terms of duration and pattern, to fund the Unfunded Actuarial Accrued Liability, or UAAL

Historical Underfunding by the State

The Illinois Pension Code sets the parameters for funding TRS. The employer contributions are determined such that, together with the member contributions, the System is projected to achieve 90% funding by 2045. The 2045 funding objective of 90% was set in 1994 as a 50-year objective. TRS members have always contributed their share. **The State funding has been inadequate, resulting in TRS being among the worst funded public employee retirement systems in the United States.**

The State has historically underfunded TRS by the use of funding policies that do not provide for adequate funding of TRS and include:

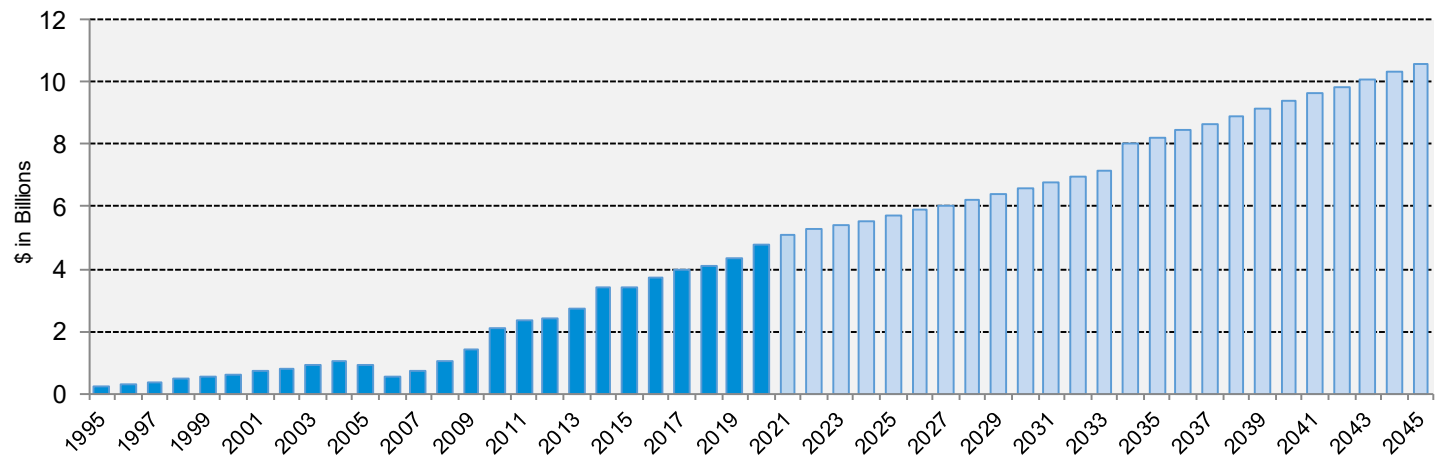
- Establishing a 50-year period in 1994, over which to amortize the Unfunded Actuarial Accrued Liability
- Back loading the 50-year period by requiring a 15-year period to ramp up to full contributions as determined under the Illinois funding policy
- Setting a funding target of 90% of the actuarial accrued liability (as opposed to 100%)
- Requiring the use of the projected unit credit cost method, which further back loads the contributions to TRS as compared to the entry age normal cost method, which is a level cost funding method

SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

- Imposing a maximum contribution based upon Pension Obligation Bond (POB) debt payments despite the fact that not all of the POB proceeds were contributed to TRS
- Reducing contributions for fiscal years ended June 30, 2006 and 2007
- Modifying the asset valuation method to reduce contributions for the fiscal year ended June 30, 2011; further reducing FY 2011 contributions by requiring TRS to recertify the 2009 valuation to assume that Tier II had been in effect in 2009
- Requiring Tier II benefit provisions for members to be hired in the future be reflected in the determination of the contribution, resulting in reduced and back-loaded contributions
- Reducing contributions for fiscal years 2018 through 2021 by retroactively phasing in the effect of assumption changes

The graph below shows a history and projection of the State required contributions under the Illinois Pension Code. The graph illustrates the effect of inadequate State contributions on projected future contributions.

CHART A
State Required Contribution for Fiscal Year Ending June 30

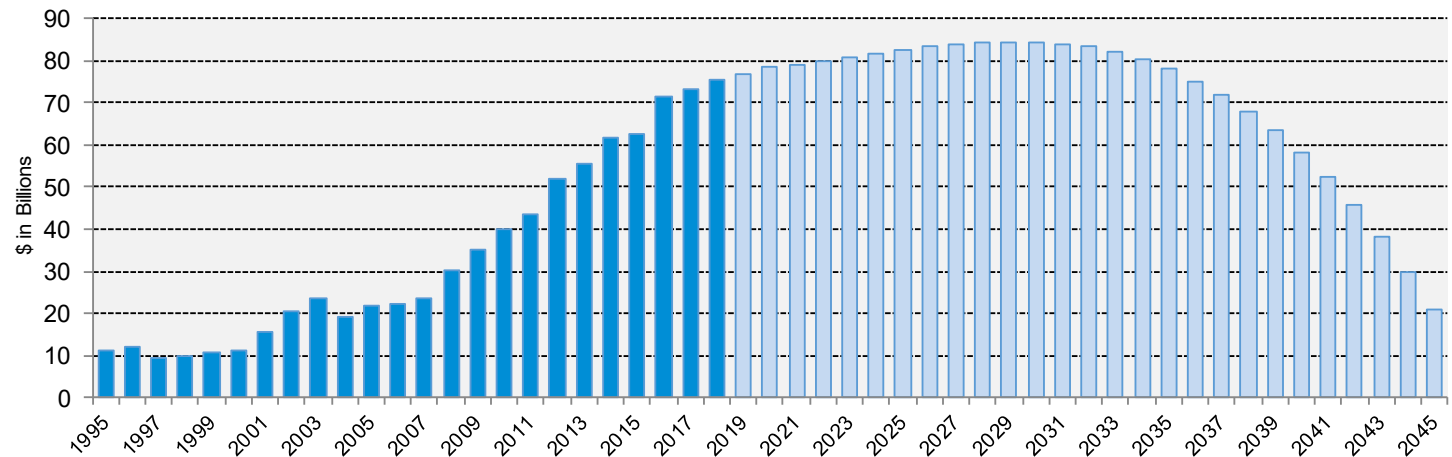


SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

The insufficiency of the State contributions is the primary reason for the historical and projected increases in UAAL as shown in the graph below.

CHART B

Unfunded Actuarial Accrued Liability as of Fiscal Year Ending June 30



Funding Policy Certified by the Board

Because State contributions under the Illinois Pension Code are inadequate, the Board of Trustees adopted a funding policy (“Board-Adopted Actuarial Funding Policy”), comprised of the following components:

- *Actuarial Cost Method:* The entry age normal method, which allocates costs evenly as a level percentage of salary
- *Asset Smoothing Method:* The actuarial value of assets is based on the market value of assets with a five-year phase-in of investment returns in excess of (or less than) expected investment income
- *Amortization Policy:* The amortization policy is a layered amortization approach. Effective with the June 30, 2015, actuarial valuation, the UAAL is amortized over a closed 20-year period. Sources of UAAL that emerge in subsequent valuations are amortized over closed 20-year periods. The amortization payment increases at the expected rate of future State revenue growth (assumed to be 2.0%, which is conservative but reasonable compared to shorter-term projections of State revenue growth). The minimum contribution is the normal cost.

SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

The Board of Trustees prepares an annual certification, which includes State contributions under the Illinois Pension Code and the Board-Adopted Actuarial Funding Policy. Unlike the current funding policy, the Board-Adopted Actuarial Funding Policy will bring TRS to full funding by decreasing the UAAL every year. **We strongly recommend an actuarial funding method that targets 100% funding where payments at least cover interest on the unfunded actuarial accrued liability and a portion of the principal balance.** The funding policy adopted by the Board, referred to as the Board-Adopted Actuarial Funding Policy, meets this standard.

Implications of Tier II

Lower Benefit Structure/Same Contribution Rate as Tier I

- Tier II members are those who first established membership with TRS or a reciprocal system after December 31, 2010. While Tier II member contributions are the same as Tier I member contributions, the value of Tier II benefits is lower than Tier I benefits. This is because Tier II members have to work longer to be eligible for retirement, the final average salary period is longer, pensionable salaries are capped, and the cost-of-living adjustments (COLAs) are smaller.
- The Tier II wage cap, which applies to benefits and contributions, was established in 2011 at \$106,800. The wage cap increases each fiscal year by the lesser of 3% or one-half of the CPI-U as of the preceding September. For the fiscal year ended June 30, 2018, the limit is \$113,645. Based upon the current actuarial assumptions, it is projected that the wage cap will affect the majority of full career Tier II members' final average salary.

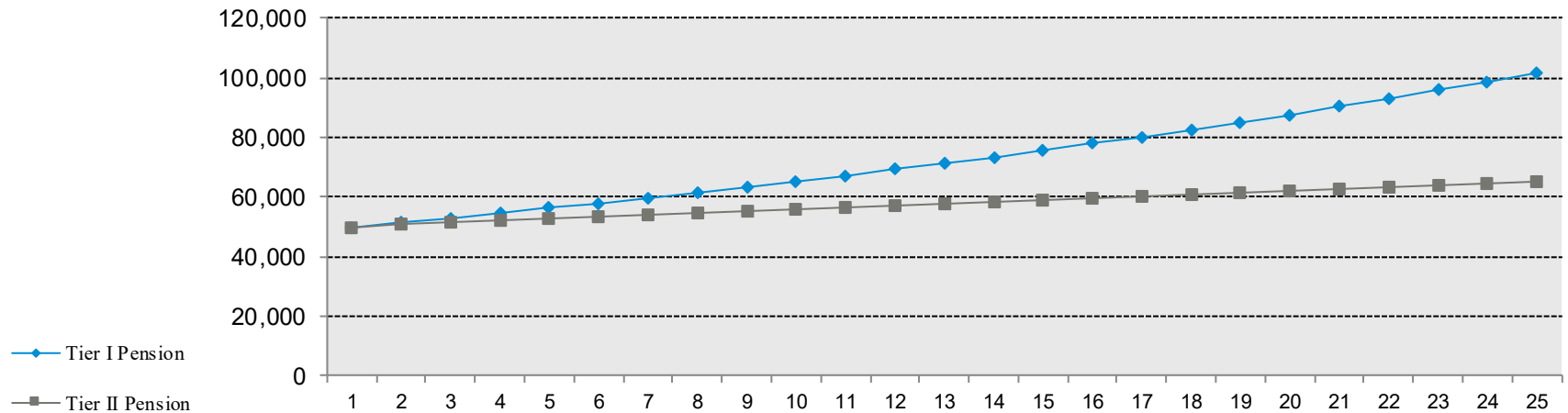
SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

Cost-of-living Adjustment

- The Tier II cost-of-living adjustment (COLA) is calculated using the lesser of 3% or one-half of CPI-U as of the preceding September, of the originally granted retirement annuity as compared to the Tier I COLA, which is a 3% compound COLA. The Tier II COLA will not keep pace with inflation, eroding the purchasing power of Tier II pensions during retirement. Chart C below shows the comparison of a \$50,000 pension under the Tier I and Tier II COLA provisions. The projection is based upon the valuation inflation assumption of 2.50%.

CHART C

Illustration of Tier I and Tier II COLA Based on Initial Annual Benefit of \$50,000



SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

Total Normal Cost Rate Compared to Member Contribution Rate

- The following chart compares the Tier I and Tier II member contribution rates to the normal cost rates for the fiscal year 2020 using the projected unit credit cost method, as required by the Illinois Pension Code. The normal cost rate is the cost of benefits that accrue during the year expressed as a percentage of payroll, based on the actuarial assumptions. Currently, the total normal cost for Tier I is approximately three times the normal cost rate for Tier II, reflecting the differences in the benefits. The Tier II total normal cost rate is currently less than the member contribution rate. As a result, based upon the actuarial assumptions, Tier II members are funding their pension benefit and paying a portion of the interest on the UAAL.

CHART D

Allocation of Member Contribution Rate

	For Fiscal Year 2020		
	Tier I	Tier II	Total
1. Total normal cost rate, including administrative expenses	22.75%	7.52%	19.66%
2. Less: member contribution rate	<u>(9.00%)</u>	<u>(9.00%)</u>	<u>(9.00%)</u>
3. Employer normal cost rate	13.75%	(1.48%)	10.66%
4. Allocation of member contribution rate			
a. Normal cost rate	9.00%	7.52%	9.00%
b. Unfunded actuarial accrued liability	<u>0.00%</u>	<u>1.48%</u>	<u>0.00%</u>
c. Total	9.00%	9.00%	9.00%

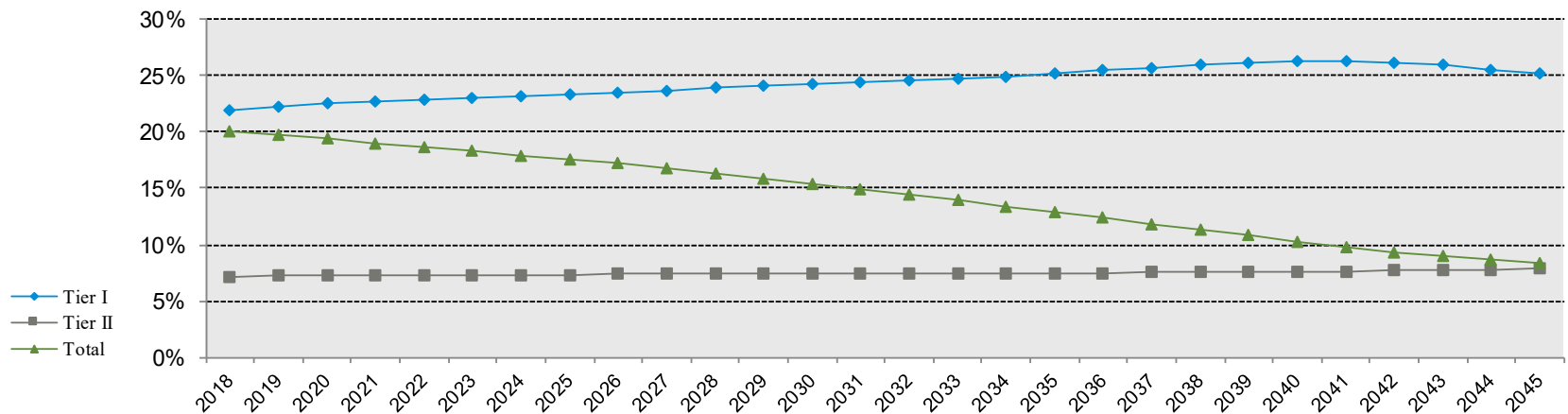
SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

Projection of Total Normal Cost Rate by Tier

- The following graph shows a projection of the total normal cost rates for Tier I, Tier II, and in total. The chart shows that the total normal cost rate will decline over time as the Tier I members terminate and retire and are replaced by Tier II members. The funding policy under the Illinois Pension Code, which targets a 90% funded ratio by 2045, requires the funding and benefit provisions for future Tier II members to be reflected in the determination of the contribution. The contributions, as determined by the Illinois Pension Code, are based on a projection of normal cost and actuarial accrued liability for Tier II members who will be hired after the valuation date and through 2045. This results in a deferral of contributions to later years.

CHART E

Projection of Total Normal Cost Rate for Fiscal Year Ending June 30

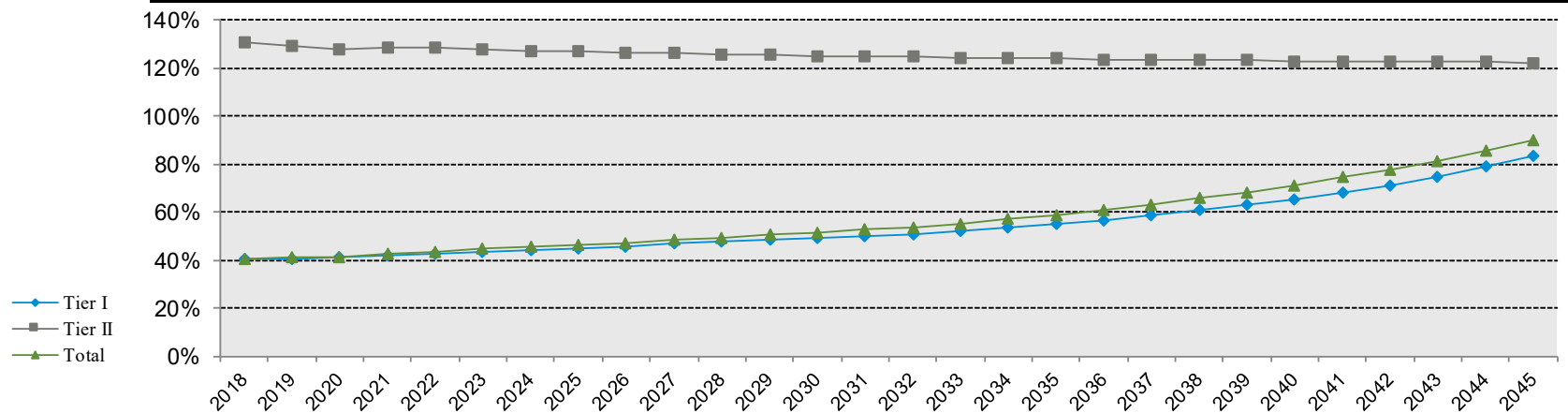


SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

Tier II Contribution Toward Unfunded Actuarial Accrued Liability

- As described above, Tier II members are funding a portion of the interest on the UAAL along with the normal cost of their benefits. Tier I and Tier II liabilities and assets are not allocated separately for purposes of determining the funded ratio and contribution requirements. However, if the assets and liabilities were allocated separately, a projection of the funded ratio for each tier would show that the Tier II funded ratio is 131% as of June 30, 2018, decreasing slightly over time to a funded ratio of 122% as of June 30, 2045. In contrast, the Tier I funded ratio is 40% as of June 30, 2018, increasing to 84% as of June 30, 2045. For the total System, the funded ratio is 41% as of June 30, 2018, increasing to 90% as of June 30, 2045. Tier II member contributions assist in increasing the total funded ratio to 90% as of 2045. The graph below illustrates this.

CHART F
Projection of Funded Ratio for Fiscal Year Ending June 30



SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

SENSITIVITY PROJECTIONS

The following charts show projections of valuation results under alternative investment return scenarios. Charts G and H show projections of the funded status and State contributions for the next five years. The projections are based on the current actuarial assumptions and assume that all actuarial assumptions are realized, with the exception of the investment return for the year ending June 30, 2019:

- Scenario 1 assumes a 0% investment return for the year ending June 30, 2019
- Scenario 2 assumes a 14% investment return for the year ending June 30, 2019

Because investment gains and losses are recognized in the actuarial value of assets over a five-year period, the effect on the funded status and State contribution in the first year is small. However, by the fifth year, the investment returns are fully reflected in the valuation. The charts show that investment gains and losses will have a significant effect on the valuation results.

CHART G

Projection of Funded Ratio for Fiscal Year Ending June 30

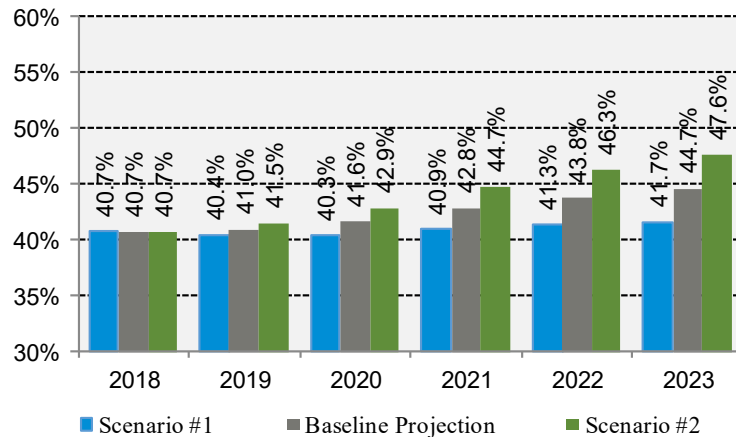
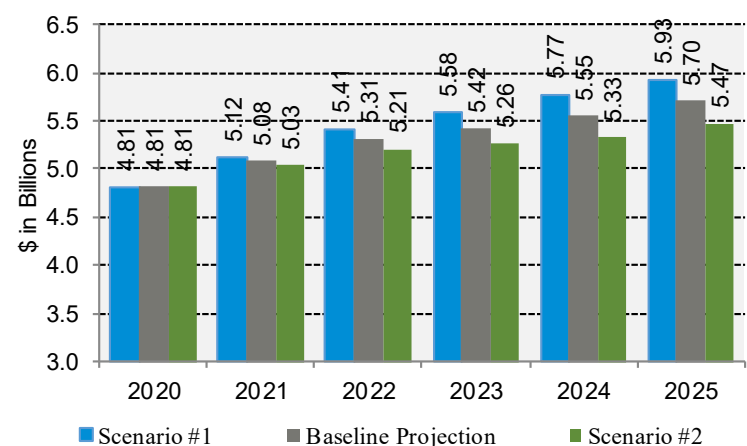


CHART H

Projection of State Contribution for Fiscal Year Ending June 30



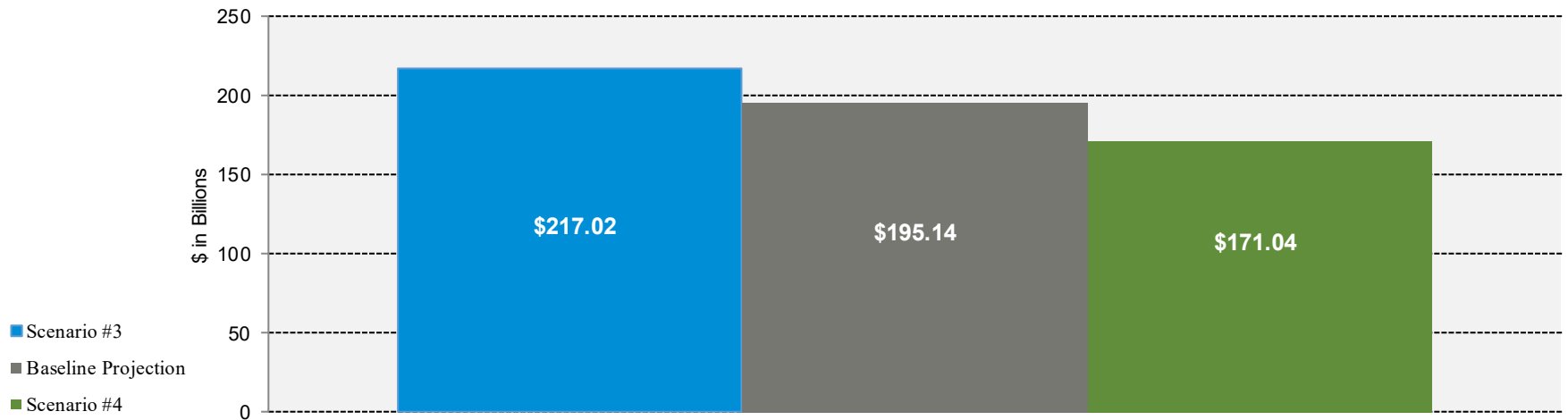
SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

Chart I shows the total State contributions for the fiscal years June 30, 2020, through June 30, 2045, based on the current actuarial assumptions and assuming that all actuarial assumptions are realized with the exception of the investment returns as follows:

- Scenario 3 assumes investment returns of 6.00% for each year beginning with the year ending June 30, 2019, through June 30, 2045
- Scenario 4 assumes investment returns of 8.00% for each year beginning with the year ending June 30, 2019, through June 30, 2045

CHART I

Total State Contribution from Year Ending June 30, 2020, Through June 30, 2045



SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

IMPORTANT INFORMATION ABOUT ACTUARIAL VALUATIONS

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual benefits and expenses paid and the actual investment experience of the System will determine the actual long-term cost of the plan.

In order to prepare a valuation, Segal Consulting (“Segal”) relies on a number of input items. These include:

- **Plan of benefits** Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
- **Participant data** An actuarial valuation for the System is based on data provided to the actuary by TRS. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
- **Assets** The valuation is based on the market value of assets as of the valuation date, as provided by TRS, and uses an “actuarial value of assets” that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
- **Actuarial assumptions** In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the System’s assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.

SECTION 1: Actuarial Valuation Summary as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The actuarial valuation is prepared at the request of the TRS Board. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement of the System's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the System will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.
- If the TRS Board is aware of any event or trend that was not considered in the valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the System's provisions, but they may be subject to alternative interpretations. TRS should look to their other advisors for expertise in these areas.
- The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and changes in plan provisions or applicable law.

As Segal has no discretionary authority with respect to the management or assets of the System, it is not a fiduciary in its capacity as actuaries and consultants with respect to the System.

SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

A. MEMBER DATA

This actuarial valuation considers the number and demographic characteristics of covered participants, including active members, retirees, and beneficiaries.

This section presents a summary of significant statistical data on these participant groups.

Data used for the valuation is as of the prior valuation date. Any changes in liabilities due to demographic experience during the most recent plan year are captured in the subsequent valuation.

More detailed information for this valuation year and the preceding valuation can be found in Section 3, Exhibits A, B, C, D, E, and G.

A historical perspective of how the population has changed over past valuations can be seen in this chart.

CHART 1

Member Population: 2008 – 2017*

June 30	Full-Time and Regular Part-Time Active Members	Substitutes, Part-Time and Hourly Paid	Inactive Members Eligible for Deferred Annuities	Inactive Members Eligible for Refunds	Annuitants and Survivor Annuitants	Ratio of Full-Time Actives to Annuitants
2008	136,328	29,146	16,039	92,377	94,419	1.44
2009	138,180	30,993	16,370	95,488	97,796	1.41
2010	137,711	32,479	16,266	99,029	101,352	1.36
2011	133,752	32,120	16,811	104,970	105,499	1.27
2012	132,956	29,073	16,995	108,531	106,102	1.25
2013	132,886	28,104	17,250	110,403	109,448	1.21
2014	132,916	26,920	17,575	113,012	112,682	1.18
2015	133,478	26,206	18,362	115,360	115,273	1.16
2016	133,505	26,080	19,038	117,817	117,990	1.13
2017	133,761	26,664	19,531	119,738	120,453	1.11

**Member data used in the valuation is as of the prior valuation date.*

SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

Active Members

Plan costs are affected by the age, years of service, and compensation of active members. As of June 30, 2017 (the date as of which census data is collected for the June 30, 2018, valuation), there were 133,761 full-time and regular part-time active members with an average age of 41.9 and 12.9 average years of service. The 135,505 full-time and regular part-time active members in the prior valuation had an average age of 41.8 and 12.8 average years of service. In addition, as of June 30, 2017, there were 26,664 active members who were substitutes, part-time, and hourly paid on either a flexible or limited work schedule.

Inactive Members

As of June 30, 2017 (the date at which census data is collected for the June 30, 2018 valuation), there were 19,503 participants and 28 survivors with a vested right to a deferred benefit. Inactive members may also be eligible for a refund of their retirement benefit contributions or a single sum benefit.

In addition, there were 119,738 participants entitled to a return of their employee contributions.

These charts show a distribution of active participants based on years of service

CHART 2
Distribution of Full-Time and Regular Part-Time Active Participants by Age as of June 30, 2017*

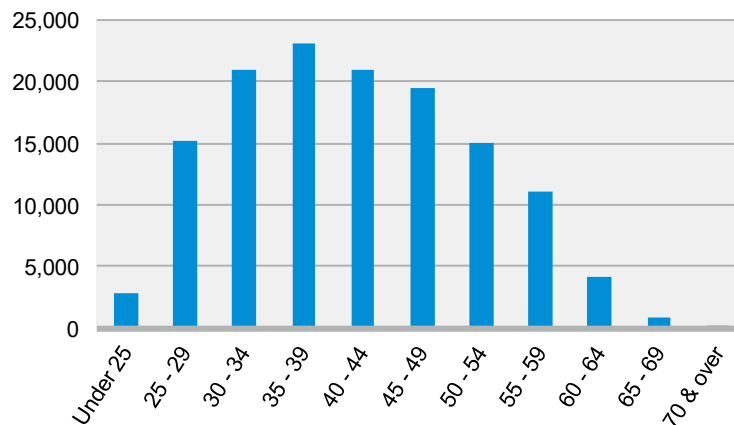
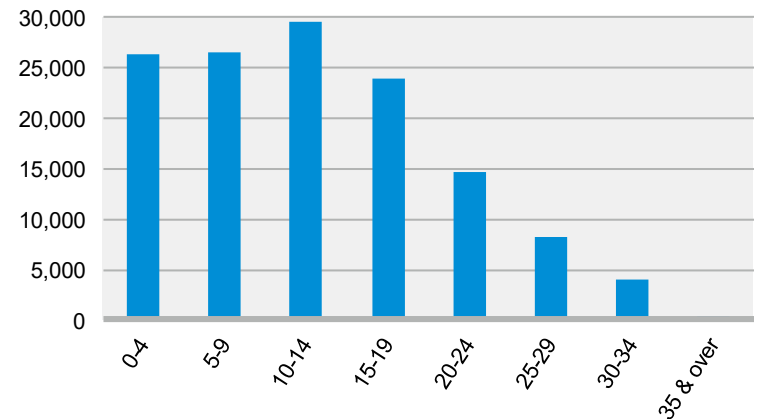


CHART 3
Distribution of Full-Time and Regular Part-Time Active Participants by Years of Service as of June 30, 2017*



* Member data used for the valuation is as of the prior valuation date.

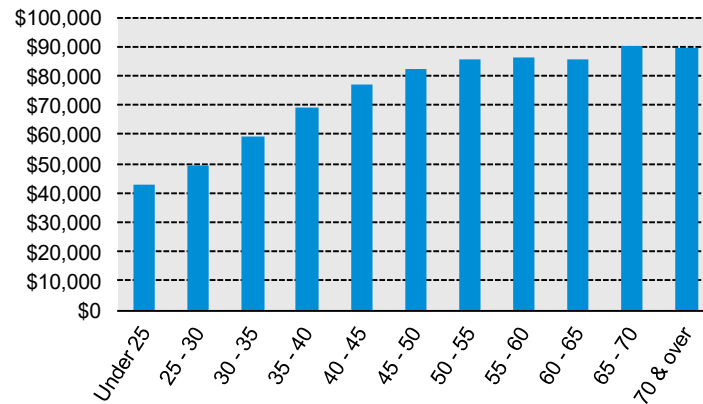
SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

Distribution of Full-Time and Regular Part-Time Active Members by Age and Average Compensation

As of June 30, 2017 (the date as of which census data is collected for the June 30, 2018 valuation), there were 133,761 full-time and regular part-time active members with an average compensation of \$71,845. The 133,505 active members used in the prior valuation had an average compensation of \$70,789.

These charts show a distribution of active members by age and by average compensation.

CHART 4
Distribution of Full-Time and Regular Part-Time Active Members by Age and Average Compensation as of June 30, 2017*



* Member data used for the valuation is as of the prior valuation date.

SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

Annuitants and Survivor Annuitants

As of June 30, 2017, (the date as of which census data is collected for the June 30, 2018 valuation), 109,453 annuitants and 11,000 survivor annuitants were receiving total annual benefits of \$6,336,471,817. For comparison, in the previous valuation, there were 107,305 annuitants and 10,685 survivor annuitants were receiving total annual benefits of \$6,033,050,890.

These charts show the distribution of the current annuitants and survivor annuitants based on their age and annual benefit, by type of pension.

CHART 5
Distribution of Annuitants and Survivor Annuitants by Annual Benefit as of June 30, 2017*

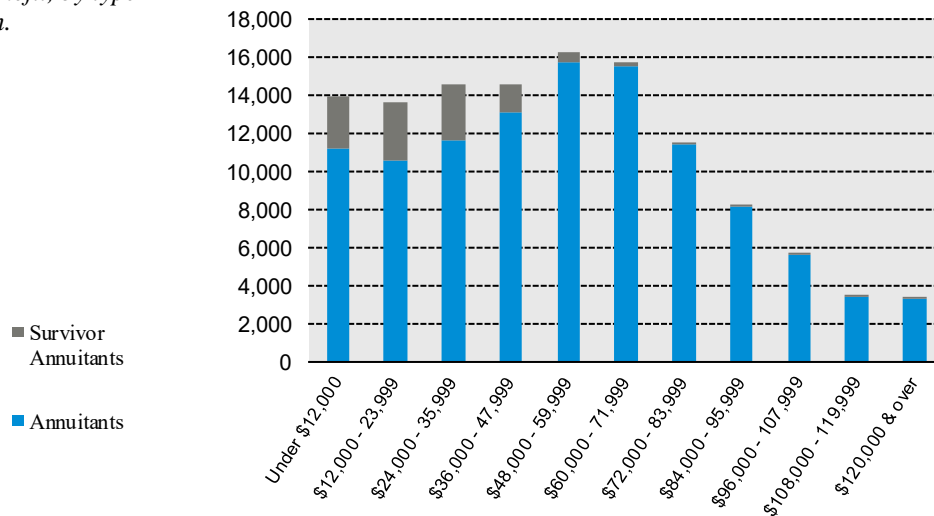
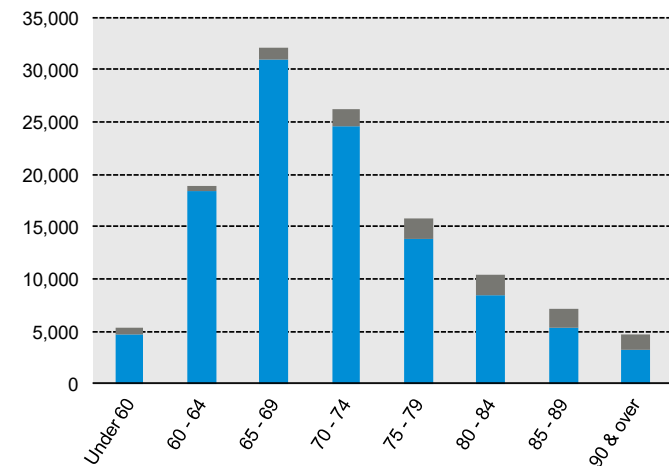


CHART 6
Distribution of Annuitants and Survivor Annuitants by Age as of June 30, 2017*



* Member data used for the valuation is as of the prior valuation date.

SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

B. FINANCIAL INFORMATION

Two actuarial values of assets are used for determining the statutory contribution under the Illinois Pension Code, one that includes the Pension Obligation Bond (POB) and one that excludes the POB. The recommended contribution under the Board's funding policy (Board-Adopted Actuarial Funding Policy) includes the POB. The actuarial value of assets under both methods gradually adjusts to market value. Under this asset valuation method, the full value of market fluctuations is recognized over a five-year period as opposed to in a single year. The amount of the

adjustment to recognize market value is treated as income, which may be positive or negative.

Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

To determine the employer contributions, the actuarial value of assets are projected one year from the valuation date to the beginning of the contribution fiscal year.

This chart shows the determination of the actuarial value of assets with POB as of the valuation date.

CHART 7

Determination of Actuarial Value of Assets and Projected Actuarial Value of Assets with POB for June 30, 2018 and June 30, 2017 Actuarial Valuations

		2018	2017
1.	Market value of assets with POB available for benefits	\$51,969,546,694	\$49,375,664,518
2.	Calculation of unrecognized return*	% Not <u>Recognized</u>	% Not <u>Recognized</u>
	<u>Original Amount**</u>		
(a)	Year ended June 30, 2018	80% \$515,131,078	
(b)	Year ended June 30, 2017	60% 1,441,042,268	80% \$1,921,389,690
(c)	Year ended June 30, 2016	40% (1,393,170,904)	60% (2,089,756,355)
(d)	Year ended June 30, 2015	20% (324,345,708)	40% (648,691,416)
(e)	Year ended June 30, 2014	0	20% <u>725,197,390</u>
(f)	Total unrecognized return	\$238,656,734	(\$91,860,691)
3.	Actuarial value of assets with POB (Current Assets): (1) – (2f)	<u>\$51,730,889,960</u>	<u>\$49,467,525,209</u>
4.	Actuarial value as a percent of market value: (3) ÷ (1)	<u>99.5%</u>	<u>100.2%</u>
5.	Projected actuarial value of assets		
(a)	Assumed contributions	\$5,401,080,673	\$5,122,759,135
(b)	Assumed distributions	6,871,992,949	6,564,787,604
(c)	Expected return at 7.00%	3,569,680,368	3,412,255,768
(d)	Projected actuarial value of assets	<u>\$53,829,658,052</u>	<u>\$51,437,752,508</u>

* Recognition at 20% per year over 5 years

**Total return minus expected return on market value

SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

For determining the actuarial value of assets without the POB, the market value of assets is estimated by adjusting for the POB. The market value of assets without the POB as of the valuation date is equal to the market value of assets without the POB as of the prior valuation date, increased by contributions excluding the POB debt service, decreased by disbursements, and credited with interest based upon the investment return of the market value of assets with the POB.

This chart shows the determination of the actuarial value of assets without POB as of the valuation date.

CHART 8

Determination of Actuarial Value of Assets and Projected Actuarial Value of Assets without POB for June 30, 2018 and June 30, 2017 Actuarial Valuations

		2018	2017
1.	Estimated market value of assets without POB available for benefits	\$46,902,662,455	\$44,348,296,834
2.	Calculation of unrecognized return*	<u>% Not Recognized</u>	<u>% Not Recognized</u>
	<u>Original Amount**</u>		
(a)	Year ended June 30, 2018	80% \$463,822,655	
(b)	Year ended June 30, 2017	60% 1,291,293,817	80% \$1,721,725,090
(c)	Year ended June 30, 2016	40% (1,241,833,038)	60% (1,862,749,558)
(d)	Year ended June 30, 2015	20% (287,620,008)	40% (575,240,016)
(e)	Year ended June 30, 2014	0	20% <u>639,474,079</u>
(f)	Total unrecognized return	\$225,663,426	(\$76,790,405)
3.	Actuarial value of assets without POB (Current Assets): (1) – (2f)	<u>\$46,676,999,029</u>	<u>\$44,425,087,239</u>
4.	Actuarial value as a percent of market value: (3) ÷ (1)	<u>99.5%</u>	<u>100.2%</u>
5.	Projected actuarial value of assets		
(a)	Assumed contributions	\$5,775,815,831	\$5,486,560,788
(b)	Assumed distributions	6,871,992,949	6,564,787,604
(c)	Expected return at 7.00%	3,229,023,733	3,072,018,168
(d)	Projected actuarial value of assets	<u>\$48,809,845,644</u>	<u>\$46,418,878,591</u>

* Recognition at 20% per year over 5 years

**Total return minus expected return on market value

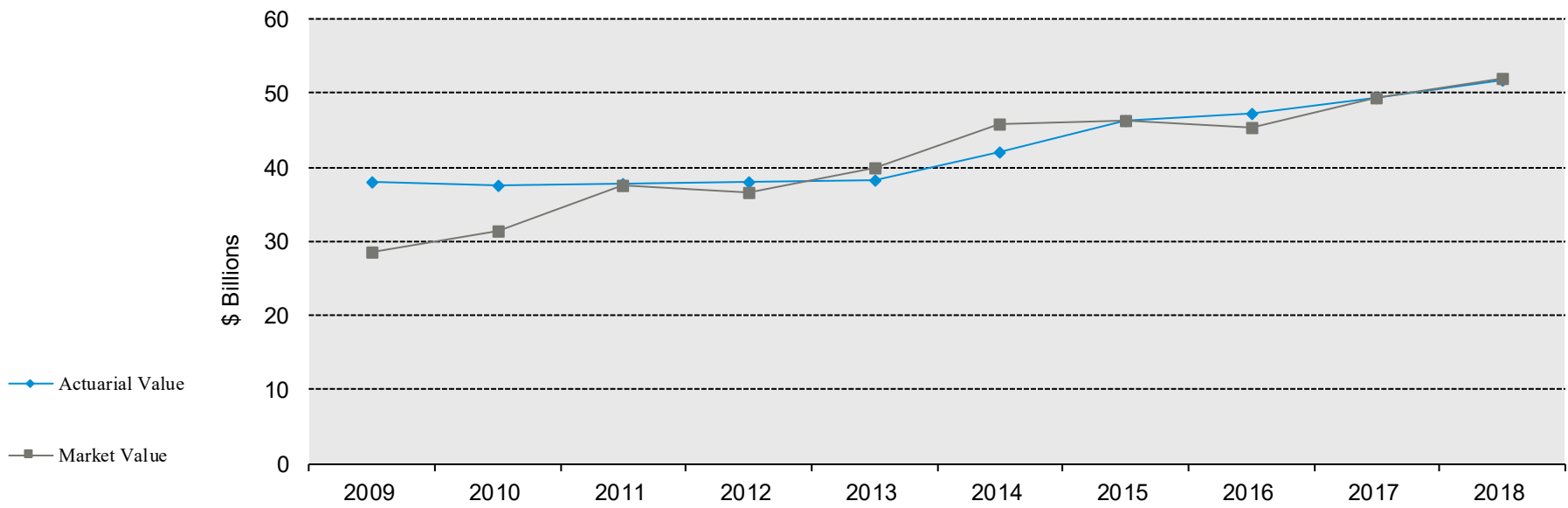
SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

Both the actuarial value and market value of assets are a representation of the TRS financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because TRS liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

This chart shows the change in the actuarial value of assets versus the market value over the past ten years.

CHART 9

Actuarial Value of Assets vs. Market Value of Assets as of June 30, 2009 – 2018 (with POB)



SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

C. ACTUARIAL EXPERIENCE

To calculate the actuarially determined contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. Overall favorable experience relative to the assumptions (an actuarial gain) causes a decrease in the contribution requirement. On the other hand, overall less favorable experience relative to the assumptions (an actuarial loss) causes an increase in the contribution requirement.

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single years' experience was a short-term

development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The total loss is \$1,035,035,877; \$306,966,173 from investment gains and \$1,342,002,050 in losses from all other sources. The net experience variation from individual sources other than investments was approximately 1.1% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

This chart provides a summary of the actuarial experience during the past year.

CHART 10
Actuarial Experience for Year Ended June 30, 2018

1. Net gain from investments*	\$306,966,173
2. Net loss from other experience**	<u>(1,342,002,050)</u>
3. Net experience loss: (1) + (2)	<u>(\$1,035,035,877)</u>

* Details in Chart 11

** Details in Chart 14

SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

Investment Rate of Return

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the TRS investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets is 7.00%. The actual rate of return on an actuarial basis for the year ended June 30, 2018, was 7.63%.

Since the actual return for the year was greater than the assumed return, TRS experienced an actuarial gain during the year ended June 30, 2018, with regard to its investments.

This chart shows the portion of the gain due to investment experience.

**CHART 11
Investment Experience for the Year Ended June 30, 2018**

	Market Value With POB	Market Value Without POB	Actuarial Value With POB
1. Value of assets as of June 30, 2017	\$49,375,664,518	\$44,348,296,834	\$49,467,525,209
2. Contributions during fiscal year ended June 30, 2018	5,117,795,720	5,481,597,373*	5,117,795,720
3. Benefits and expenses during fiscal year ended June 30, 2018	6,573,185,272	6,573,185,272	6,573,185,272
4. Value of assets as of June 30, 2018	51,969,546,694	46,902,662,455	51,730,889,960
5. Total investment income: (4) – (1) – (2) + (3)	4,049,271,728	3,645,953,520	3,718,754,303
6. Average value of assets: (1) + ((2) - (3)) ÷ 2	48,647,969,742	43,802,502,885	48,739,830,433
7. Actual rate of return: (5) ÷ (6)	8.32%	8.32%	7.63%
8. Assumed rate of return	7.00%	7.00%	7.00%
9. Expected return: (6) x (8)	\$3,405,357,881	\$3,066,175,201	\$3,411,788,130
10. Actuarial gain: (5) – (9)	<u>\$643,913,847</u>	<u>\$579,778,319</u>	<u>\$306,966,173</u>

* Includes POB debt service

SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the market value investment return for the last twenty years, including five-year, ten-year, fifteen-year, and twenty-year averages. Note that the actuarial value of assets was equal to the

market value of assets prior to June 30, 2009. Effective June 30, 2009, the actuarial value of assets was changed to a method under which market fluctuations in excess of or below the assumed investment return are recognized over a five-year period. The returns were determined by the actuary and may be different from the returns reported in the Comprehensive Annual Financial Report.

CHART 12
Investment Return

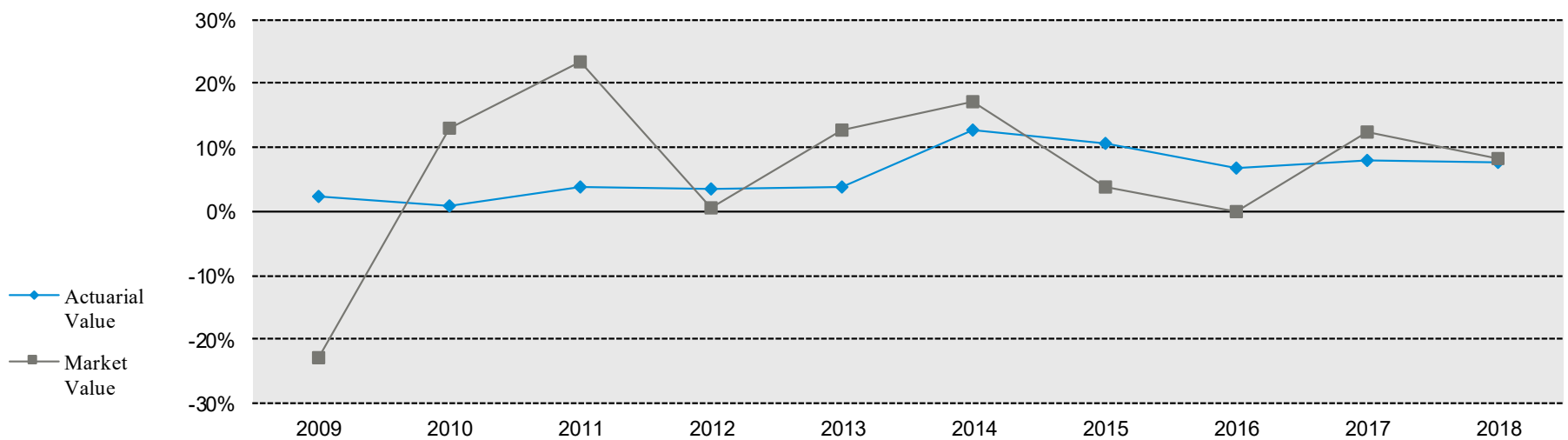
Year Ended June 30	Market Value	Actuarial Value
1999	10.44%	10.44%
2000	10.53	10.53
2001	(4.16)	(4.16)
2002	(3.12)	(3.12)
2003	4.78	4.78
2004	16.46	16.46
2005	10.69	10.69
2006	11.98	11.98
2007	19.07	19.07
2008	(4.89)	(4.89)
2009	(22.89)	2.22
2010	12.97	0.71
2011	23.50	3.84
2012	0.61	3.64
2013	12.70	3.83
2014	17.19	12.75
2015	3.91	10.76
2016	(0.10)	6.46
2017	12.39	7.83
2018	8.32	7.63
Average Returns		
Last 5 years:	8.2%	9.1%
Last 10 years:	6.1%	5.9%
Last 15 years:	7.5%	7.4%
Last 20 years:	6.5%	6.4%

SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

The actuarial asset valuation method gradually takes into account fluctuations in the market value rate of return. The effect of this is to stabilize the actuarial rate of return, which contributes to leveling pension plan costs. Chart 13 illustrates the effect that the asset returns on a market value basis are more volatile than asset returns on an actuarial basis.

This chart illustrates how this leveling effect has actually worked over the 10 year period.

CHART 13
Market Value and Actuarial Rates of Return for Years Ended June 30, 2009 - 2018



SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

Other Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include, but are not limited to:

- salary increases different than assumed,
- retirement experience (earlier or later than expected),
- disability experience different than assumed, and
- the extent of turnover among the participants,

- mortality (more or fewer deaths than expected) and,
- new entrants

The loss from this other experience for the year ended June 30, 2018, amounted to \$1,342,002,050, which is approximately 1.1% of the actuarial accrual liability. This is largely due to net unfavorable retirement experience. A five-year history of the demographic gain/(loss) experience is shown in the chart below.

This chart shows a five-year history of the elements of experience gain/(loss).

CHART 14

Experience Due to Changes in Demographics for Years Ended June 30, 2014 to June 30, 2018

	Year Ended June 30				
	2018	2017	2016	2015	2014
1. Salary increases	\$40,293,935	(\$29,518,579)	\$65,504,184	\$468,541,235	\$474,190,195
2. Retirement experience	(341,957,544)	(365,965,251)	(237,492,448)	(302,761,415)	(119,675,346)
3. Disability experience	24,275,853	23,361,862	16,091,632	13,393,193	3,237,170
4. Termination experience	(19,458,838)	(25,597,354)	(15,147,793)	(56,862,195)	4,442,984
5. Mortality experience	(42,624,422)	(24,539,086)	(49,779,799)	45,647,175	74,308,199
6. Rehires	(36,264,543)	(32,789,033)	(23,266,945)	(13,630,966)	(37,754,909)
7. New entrants	16,845,581	16,627,360	17,516,646	(5,168,927)	315,731
8. Other	<u>(983,112,072)*</u>	<u>(165,896,422)</u>	<u>(737,480,200)**</u>	<u>(21,988,860)</u>	<u>2,815,856</u>
9. Total	(\$1,342,002,050)	(\$604,316,503)	(\$964,054,723)	\$127,169,240	\$401,879,880

* Primarily due to programming enhancements.

**Primarily due to a change in software/actuary, which is within a normal range for this change for a plan the size of TRS.

SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

D. DEVELOPMENT OF EMPLOYER CONTRIBUTIONS

Statutory Funding under Illinois Pension Code

The amount of the employer contribution as determined by the Illinois Pension Code is the amount, which, as a level percentage of member payroll, will result in the System being 90% funded by June 30, 2045. The employer contributions include contributions from the State, Federal and School Districts. Federal contributions are based on the assumption that 2.00% of total payroll is attributable to Federal Funds payroll. For fiscal 2020, the School Districts' contributions are expected to equal 0.58% of total payroll under Sec. 16-158(e), approximately 0.19% of total payroll under Sec. 16-158(f), and approximately 0.03% of total payroll under Sec. 16-158(i-5). The actuarial cost method is the projected unit credit method.

Recommended Funding under Board-Adopted Actuarial Funding Policy

The Actuarially Determined Contribution under the Board's funding policy, called the Board-Adopted Actuarial Funding Policy, is comprised of an employer normal cost payment and a payment on the unfunded actuarial accrued liability. The amortization of the unfunded accrued liability is a closed 20-year period effective June 30, 2015, and will decline by one year in each subsequent valuation. Sources of unfunded actuarial accrued liability that emerge in subsequent valuations are amortized over closed 20-year periods. Contributions toward the unfunded actuarial accrued liability increase by 2% each year, the estimated increase in future State revenue growth. The actuarial cost method is the entry age normal method. The minimum contribution is the normal cost.

Chart 15 shows the development of employer contributions under Statutory Funding and the Board-Adopted Actuarial Funding Policy.

SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

This chart shows a comparison of the employer contributions based on the Statutory Funding Plan to the actuarially determined contribution (Board-Adopted Actuarial Funding Policy)

CHART 15

Employer Contributions

	Fiscal Year Ending June 30	
	2020	2019⁺
Based on Statutory Funding Plan		
1. Benefit Trust Reserve:		
a. Employer's cost as percentage of membership payroll	46.01%	45.06%
b. Total employer contribution: (1a) * (8)	\$5,040,022,842	\$4,798,467,909
c. School Districts contributions under Sec. 16-158	(87,086,402)	(68,304,290)
d. Federal Funds contribution	(23,355,172)	(20,979,899)
e. Phase-in of the effect of assumption changes	<u>(116,503,572)</u>	<u>(355,859,795)</u>
f. State Contribution: (1b) + (1c) + (1d) + (1e)	\$4,813,077,696	\$4,353,323,925
2. Guaranteed Minimum Annuity Reserve	<u>500,000</u>	<u>600,000</u>
3. Total State Contribution: (1f) + (2)	\$4,813,577,696	\$4,353,923,925
Based on Board-Adopted Actuarial Funding Policy (Actuarially Determined Contribution)		
4. Benefit Trust Reserve:		
a. Normal cost plus amortization of UAAL	\$7,988,612,283	\$7,429,036,790
b. School Districts contributions under Sec. 16-158	(87,086,402)	(68,304,290)
c. Federal Funds contribution	<u>(23,355,172)</u>	<u>(20,979,899)</u>
d. State Contribution: (4a) + (4b) + (4c)	\$7,878,170,709	\$7,339,752,601
5. Guaranteed Minimum Annuity Reserve	<u>500,000</u>	<u>600,000</u>
6. Total State Contribution: (4d) + (5)	\$7,878,670,709	\$7,340,352,601
Difference Between Board-Adopted Actuarial Funding Policy and Statutory Funding		
7. Shortfall/(Excess): (6) – (3)	\$3,065,093,013	\$2,986,428,676
Expected Membership Payroll		
8. Total membership payroll	\$10,954,583,571	\$10,649,695,100

⁺ Revised to reflect Public Act 100-0587

SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

E. RISK

Since the actuarial valuation results are dependent on a given set of assumptions and data as of a specific date, there is a risk that emerging results may differ significantly as actual experience differs from the assumptions.

This report does not contain a detailed analysis of the potential range of future measurements, but does include a brief discussion of some risks that may affect the Plan. Upon request, a more detailed assessment of the risks can be provided to enable a better understanding of the risks specific to your Plan.

Investment Risk

If the actual return on the market value of assets for the next Plan Year were 1% different from the assumed (either higher or lower), the projected unfunded actuarial liability would change by 0.7%, or about \$500 million.

Since the Plan's assets are much larger than contributions, investment performance may create significant volatility in contribution requirements. For example, for each 1% difference in return from the assumed return, the Board-Adopted Actuarial Funding Policy contribution would increase or decrease by approximately \$675 million (8.0% of payroll) and the Statutory contribution requirement would increase or decrease by approximately \$500 million (4.5% of payroll).

The market value rate of return over the last 10 years has ranged from a low of -22.9% to a high of 23.5%, with an average of 6.1%.

Longevity Risk

The actuarial valuation includes an expectation of future improvement in life expectancy. Emerging plan experience that does not match these expectations will result in either an increase or decrease in the TRS funding policy and statutorily required contribution amounts.

Contribution Risk

The TRS funding policy contribution requires payment of the System's normal cost and an amortization payment according to a schedule sufficient to pay down unfunded actuarial liability over time. If the TRS funding policy contribution were adhered to, contribution risk would be negligible.

However, Plan contributions are set by statute. The statutorily-required amount systematically underfunds TRS. Among other things, it: a) is based on a funding target of 90% of the actuarial accrued liability (as opposed to 100%); b) requires the use of the projected unit credit cost method, which further back loads the contributions to TRS as compared to the entry age normal cost method, which is a level cost funding method; c) imposes a maximum contribution based upon Pension Obligation Bond (POB) debt payments despite the fact that not all of the POB proceeds were contributed to TRS; and d) requires Tier II benefit provisions for members to be hired in the future be reflected in the determination of the contribution, resulting in reduced and back-loaded contributions.

SECTION 2: Actuarial Valuation Results as of June 30, 2018, for the Teachers' Retirement System of the State of Illinois

If contributions remain at current level and future experience matches the current assumptions, we project the unfunded actuarial accrued liability will not be paid off.

Demographic Risk

Examples of this risk include:

- Actual retirements occurring earlier or later than assumed. The value of retirement plan benefits is sensitive to the rate of benefit accruals and any early retirement subsidies that apply.
- More or less active participant turnover than assumed.
- Individual salary increases higher or lower than assumed.

Actual Experience Over the Last 10 years and Implications for the Future

Past experience can help demonstrate the sensitivity of key results to the Plan's actual experience. Over the past ten years:

- The investment gain/(loss) for a year has ranged from a gain of \$1,792 million to a loss of \$11,868 million.
- The non-investment gain/(loss) for a year has ranged from a gain of \$592 million to a loss of \$1,342 million.
- The funded percentage on the actuarial value of assets has ranged from a low of 39.8% to a high of 52.1% since 2009.

Maturity Measures

As pension plans mature, the cash need to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the Plan's asset allocation is aligned to meet emerging pension liabilities.

Currently the Plan has a Full-Time actives to annuitant ratio of 1.11. For the prior year, contributions received were \$1,433 million less than benefits paid. As the Plan continues to mature, more cash will be needed from the investment portfolio to meet benefit payments.

SECTION 3: Supplemental Information for the Teachers' Retirement System of the State of Illinois

**EXHIBIT A
Summary of Membership Data**

Category	Valuation as of June 30*		Change From Prior Year
	2018	2017	
Active members:			
1. Number			
a. Full-time and regular part-time			
Tier I	109,845	113,541	-3.26%
Tier II	<u>23,916</u>	<u>19,964</u>	19.80%
Total	133,761	133,505	0.19%
b. Substitutes, part-time, and hourly paid			
Tier I	14,088	14,721	-4.30%
Tier II	<u>12,576</u>	<u>11,359</u>	10.71%
Total	26,664	26,080	2.24%
c. Total number of active members			
Tier I	123,933	128,262	-3.38%
Tier II	<u>36,492</u>	<u>31,323</u>	16.50%
Total	160,425	159,585	0.53%
2. Annual salaries			
a. Full-time and regular part-time			
Tier I	\$8,422,128,884	\$8,496,510,578	-0.88%
Tier II	<u>1,187,872,721</u>	<u>954,226,848</u>	24.49%
Total	\$9,610,001,605	\$9,450,737,426	1.69%
b. Substitutes, part-time, and hourly paid			
Tier I	\$85,978,798	\$91,454,518	-5.99%
Tier II	<u>66,412,157</u>	<u>63,268,976</u>	4.97%
Total	\$152,390,955	\$154,723,494	-1.51%
c. Total annual salaries			
Tier I	\$8,508,107,682	\$8,587,965,096	-0.93%
Tier II	<u>1,254,284,878</u>	<u>1,017,495,824</u>	23.27%
Total	\$9,762,392,560	\$9,605,460,920	1.63%

*Member data used in the valuation is as of the prior valuation date.

SECTION 3: Supplemental Information for the Teachers' Retirement System of the State of Illinois

**EXHIBIT A (continued)
Summary of Membership Data**

Category	Valuation as of June 30*		Change From Prior Year
	2018	2017	
Active members (continued):			
3. Average age			
a. Full-time and regular part-time	41.9	41.8	N/A
b. Substitutes, part-time, and hourly paid	45.0	44.6	N/A
c. Total	42.4	42.2	N/A
4. Average service			
a. Full-time and regular part-time	12.9	12.8	N/A
b. Substitutes, part-time, and hourly paid	2.4	2.4	N/A
c. Total	11.2	11.1	N/A
Inactive members:			
Eligible for deferred annuities	19,531	19,038	2.59%
Eligible for refunds or single sum benefits	<u>119,738</u>	<u>117,817</u>	1.63%
Total	139,269	136,855	1.76%
Service retirees:			
1. Number			
a. Regular	74,709	71,828	4.01%
b. ERI	9,043	9,362	-3.41%
c. ERO	<u>24,604</u>	<u>25,024</u>	-1.68%
d. Total	108,356	106,214	2.02%
2. Annual annuities			
a. Regular	\$3,804,718,835	\$3,548,700,993	7.21%
b. ERI	539,813,275	541,899,772	-0.39%
c. ERO	<u>1,691,159,333</u>	<u>1,663,152,070</u>	1.68%
d. Total	\$6,035,691,443	\$5,753,752,835	4.90%
3. Average age	71.6	71.3	N/A
4. Average monthly benefit	\$4,642	\$4,514	2.83%

*Member data used in the valuation is as of the prior valuation date.

SECTION 3: Supplemental Information for the Teachers' Retirement System of the State of Illinois

**EXHIBIT A (continued)
Summary of Membership Data**

Category	Valuation as of June 30*		Change From Prior Year
	2018	2017	
Disability annuitants:			
1. Number			
a. Retirement Allowance	802	776	3.35%
b. Occupational	4	3	33.33%
c. Temporary	<u>291</u>	<u>312</u>	-6.73%
d. Total	1,097	1,091	0.55%
2. Annual annuities			
a. Retirement Allowance	\$22,135,006	\$20,788,436	6.48%
b. Occupational	195,608	163,085	19.94%
c. Temporary	<u>8,830,086</u>	<u>9,232,459</u>	-4.36%
d. Total	\$31,160,700	\$30,183,980	3.24%
3. Average age	59.6	59.6	N/A
4. Average monthly benefit	\$2,367	\$2,306	2.65%
Survivor annuitants:			
1. Number			
a. Children	76	73	4.11%
b. Survivors	10,722	10,408	3.02%
c. Reversionary	<u>202</u>	<u>204</u>	-0.98%
d. Total	11,000	10,685	2.95%
2. Annual annuities			
a. Children	\$925,767	\$837,690	10.51%
b. Survivors	260,695,638	240,534,153	8.38%
c. Reversionary	<u>7,998,269</u>	<u>7,742,232</u>	3.31%
d. Total	\$269,619,674	\$249,114,075	8.23%
3. Average age	78.0	77.9	N/A
4. Average monthly benefit	\$2,043	\$1,943	5.15%
Total number of participants	420,147	414,430	1.38%

*Member data used in the valuation is as of the prior valuation date.

SECTION 3: Supplemental Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT B

**Active Membership Data as of June 30, 2017 used in June 30, 2018 Actuarial Valuation –
Number and Average Annual Salary**

Full-Time and Regular Part-Time										
Age	Total	Years of Service								
		0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	2,938	2,937	1	--	--	--	--	--	--	--
	\$42,645	\$42,641	\$56,137	--	--	--	--	--	--	--
25 - 29	15,103	10,836	4,267	--	--	--	--	--	--	--
	\$49,619	\$47,879	\$54,037	--	--	--	--	--	--	--
30 - 34	20,930	4,842	10,983	5,105	--	--	--	--	--	--
	\$59,426	\$51,225	\$59,178	\$67,738	--	--	--	--	--	--
35 - 39	23,070	2,735	4,394	11,737	4,204	--	--	--	--	--
	\$69,248	\$53,565	\$61,149	\$71,864	\$80,612	--	--	--	--	--
40 - 44	20,958	1,996	2,514	4,686	9,384	2,378	--	--	--	--
	\$76,782	\$53,285	\$61,183	\$73,238	\$83,970	\$91,613	--	--	--	--
45 - 49	19,393	1,397	1,928	3,194	4,336	6,719	1,819	--	--	--
	\$81,948	\$54,381	\$60,359	\$72,473	\$84,188	\$92,919	\$96,780	--	--	--
50 - 54	15,071	836	1,239	2,310	2,472	2,739	3,978	1,497	--	--
	\$85,379	\$53,703	\$60,927	\$70,907	\$81,921	\$92,280	\$98,341	\$104,279	--	--
55 - 59	11,065	446	725	1,692	2,243	1,876	1,797	2,130	156	--
	\$86,395	\$54,718	\$62,723	\$70,880	\$80,107	\$89,579	\$97,398	\$106,102	\$111,533	--
60 - 64	4,164	209	289	715	1,041	828	556	316	182	28
	\$85,652	\$54,488	\$65,999	\$75,671	\$82,052	\$91,247	\$98,406	\$104,723	\$111,338	\$108,926
65 & over	1,069	62	65	172	247	196	145	86	38	58
	\$89,994	\$59,755	\$67,992	\$79,690	\$88,342	\$93,675	\$99,660	\$104,737	\$113,234	\$110,882
Total	133,761	26,296	26,405	29,611	23,927	14,736	8,295	4,029	376	86
	\$71,845	\$49,639	\$59,228	\$71,442	\$82,807	\$92,081	\$97,822	\$105,287	\$111,611	\$110,245

SECTION 3: Supplemental Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT C

10-Year History of Active Membership Data

Full-Time and Regular Part-Time					
Census Date June 30	Number	Percentage Change in Membership	Total Salaries	Average Annual Salary	Percentage Change in Average Salary
2008	136,328	3.1%	\$8,723,099,000	\$63,986	3.7%
2009	138,180	1.4%	9,147,433,000	66,199	3.5%
2010	137,711	(0.3%)	9,412,873,000	68,352	3.3%
2011	133,752	(2.9%)	9,358,470,000	69,969	2.4%
2012	132,956	(0.6%)	8,874,281,176	66,476	(4.6%)
2013	132,886	(0.1%)	8,984,821,118	67,613	1.3%
2014	132,916	0.0%	9,115,480,030	68,581	1.4%
2015	133,478	0.4%	9,286,852,068	69,576	1.5%
2016	133,505	0.0%	9,450,737,426	70,789	1.7%
2017	133,761	0.2%	9,610,001,605	71,845	1.5%

Substitutes, Part-Time and Hourly-Paid					
Census Date June 30	Number	Percentage Change in Membership	Total Salaries	Average Annual Salary	Percentage Change in Average Salary
2008	29,146	2.2%	\$149,452,000	\$5,128	4.9%
2009	30,993	6.3%	154,121,000	4,973	(3.0%)
2010	32,479	4.8%	161,461,000	4,971	0.0%
2011	32,120	(1.1%)	153,261,000	4,772	(4.0%)
2012	29,073	(9.5%)	154,240,000	5,305	11.2%
2013	28,104	(3.3%)	143,217,984	5,096	(3.9%)
2014	26,920	(4.2%)	143,897,458	5,345	4.9%
2015	26,206	(2.7%)	148,630,024	5,672	6.1%
2016	26,080	(0.5%)	154,723,494	5,933	4.6%
2017	26,664	2.2%	152,390,955	5,715	(3.7%)

SECTION 3: Supplemental Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT D

History of Active Membership Data by Tier

Tier I					
Census Date June 30	Number	Percentage Change in Membership	Total Salaries	Average Annual Salary	Percentage Change in Average Salary
2013	144,987	N/A	\$8,975,899,676	\$61,908	N/A
2014	138,700	(4.3%)	8,705,746,049	62,767	1.4%
2015	133,498	(3.8%)	8,649,528,420	64,791	3.2%
2016	128,262	(3.9%)	8,587,965,096	66,956	3.3%
2017	123,933	(3.4%)	8,508,107,682	68,651	2.5%

Tier II					
Census Date June 30	Number	Percentage Change in Membership	Total Salaries	Average Annual Salary	Percentage Change in Average Salary
2013	16,003	N/A	\$360,008,829	\$22,496	N/A
2014	21,136	32.1%	553,631,439	26,194	16.4%
2015	26,186	23.9%	785,878,433	30,011	14.6%
2016	31,323	19.6%	1,017,495,824	32,484	8.2%
2017	36,492	16.5%	1,254,284,878	34,372	5.8%

Note membership data by Tier includes substitutes, part-time, and hourly paid members.

SECTION 3: Supplemental Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT E

10-Year History of Annuitant and Survivor Annuitant Membership

Valuation as of June 30	Number	Percentage Change in Number of Recipients	Annual Allowances	Percentage Change in Allowances	Average Annual Annuity
2008	94,419	3.2%	\$3,812,546,000	7.4%	\$40,379
2009	97,796	3.6%	4,107,592,000	7.7%	42,002
2010	101,352	3.6%	4,418,017,000	7.6%	43,591
2011	105,499	4.1%	4,780,743,000	8.2%	45,316
2012	106,102	0.6%	4,811,370,000	0.6%	45,347
2013	109,448	3.2%	5,204,460,272	8.2%	47,552
2014	112,682	3.0%	5,505,783,524	5.8%	48,861
2015	115,273	2.3%	5,728,198,887	4.0%	49,692
2016	117,990	2.4%	6,033,050,890	5.3%	51,132
2017	120,453	2.1%	6,336,471,817	5.0%	52,605

SECTION 3: Supplemental Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT F

Benefit Stream for Guaranteed Minimum Annuity Reserve

Fiscal Year	Projected Benefit Stream for Guaranteed Minimum Annuity Reserve	Fiscal Year	Projected Benefit Stream for Guaranteed Minimum Annuity Reserve
2019	\$536,893	2044	\$10,604
2020	475,289	2045	8,712
2021	416,450	2046	7,108
2022	362,160	2047	5,730
2023	313,598	2048	4,592
2024	270,724	2049	3,643
2025	233,226	2050	2,859
2026	200,661	2051	2,216
2027	172,517	2052	1,694
2028	148,178	2053	1,275
2029	127,273	2054	944
2030	109,312	2055	688
2031	93,821	2056	492
2032	80,492	2057	346
2033	68,987	2058	239
2034	59,053	2059	163
2035	50,470	2060	98
2036	43,036	2061	62
2037	36,600	2062	38
2038	31,033	2063	23
2039	26,223	2064	13
2040	22,065	2065	7
2041	18,504	2066	4
2042	15,450	2067	2
2043	12,831	2068	1

SECTION 3: Supplemental Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT G

Reconciliation of Member Data

	Active Members	Inactive Member Eligible for Allowance	Inactive Member Eligible for Refund	Service Retirees	Disabled Retirees	Beneficiaries	Deferred Beneficiaries	Total
A. Number as of June 30, 2016	159,585	19,009	117,817	106,214	1,091	10,685	29	414,430
B. New members	10,906	N/A	N/A	N/A	N/A	N/A	N/A	10,906
C. Participant movement								
1. Retirements	(3,519)	(599)	(170)	4,288	0	0	0	0
2. Disabilities	(116)	(5)	0	0	121	0	0	0
3. Conversion from disability to service pension	N/A	N/A	N/A	38	(38)	N/A	N/A	0
4. Died with beneficiary	(40)	(1)	0	(770)	(10)	915	4	98*
5. Died without beneficiary	(88)	(21)	(259)	(1,453)	(22)	(596)	0	(2,439)
6. Terminations – with vested rights	(2,591)	2,591	0	0	0	0	0	0
7. Terminations – without vested rights	(7,666)	0	7,666	0	0	0	0	0
8. Refunds	(717)	(354)	(1,833)	N/A	N/A	N/A	0	(2,904)
9. Rehired as active	4,672	(1,123)	(3,509)	(5)	(35)	0	0	0
10. Temporary annuity expired	N/A	N/A	NA	N/A	N/A	(4)	N/A	(4)
D. Data adjustment	<u>(1)</u>	<u>6</u>	<u>26</u>	<u>44</u>	<u>(10)</u>	<u>0</u>	<u>(5)</u>	<u>60</u>
E. Number as of June 30, 2017	160,425	19,503	119,738	108,356	1,097	11,000	28	420,147

* Includes multiple beneficiaries

SECTION 3: Supplemental Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT H

Summary Statement of Income and Expenses on a Market Value Basis

	Year Ended June 30, 2018	Year Ended June 30, 2017
Net assets at market value at the beginning of the year	\$49,375,664,518	\$45,250,956,731
Contribution income:		
Members	\$938,037,245	\$929,130,165
State of Illinois	4,095,125,358	3,986,363,699
Employers:		
Early retirement	0	10,776,747
Federal funds	20,041,292	75,694,656
2.2 Benefit formula	59,837,569	57,964,519
Excess salary/sick leave	<u>4,754,256</u>	<u>5,059,655</u>
Total contribution income	\$5,117,795,720	\$5,064,989,441
Investment income:		
Net appreciation (depreciation)	\$3,124,845,615	\$4,676,047,504
Alternative	946,974,692	897,514,621
Interest and dividends	806,299,291	685,696,063
Other	1,692,247	23,479,101
Securities lending	14,237,647	17,308,948
Less alternatives expense	(458,566,901)	(428,905,050)
Less direct investment expense	(385,356,613)	(349,649,601)
Less securities lending management fees	<u>(854,250)</u>	<u>(1,038,585)</u>
Net investment income	<u>4,049,271,728</u>	<u>5,520,453,001</u>
Total income available for benefits	\$9,167,067,448	\$10,585,442,442
Less benefit payments and administrative expenses:		
Retirement benefits	(\$6,140,877,388)	(\$5,857,968,199)
Survivor benefits	(285,067,712)	(263,429,481)
Disability benefits	(32,764,545)	(31,470,071)
Refund of contributions	(92,924,731)	(285,138,169)
Administrative expenses	<u>(21,550,896)</u>	<u>(22,728,735)</u>
Net benefit payments and administrative expenses	(\$6,573,185,272)	(\$6,460,734,655)
Net assets at market value at the end of the year	\$51,969,546,694	\$49,375,664,518

SECTION 3: Supplemental Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT I

Summary Statement of System Assets

	Year Ended June 30, 2018	Year Ended June 30, 2017
Cash equivalents	\$32,034,294	\$38,331,642
Accounts receivable and prepaid expenses:		
Member contributions	\$55,935,950	\$54,778,150
Employer contributions	8,098,383	13,508,665
State of Illinois	422,893,664	492,161,607
Investment income	113,336,497	114,926,644
Investments sold	5,253,629,488	9,381,897,730
Other receivables	204,836	-
Prepaid expenses	<u>2,659,193</u>	<u>2,318,900</u>
Total accounts receivable and prepaid expenses	\$5,856,758,011	\$10,059,591,696
Investments at market value:		
Fixed income	12,138,093,138	\$10,552,182,948
Public equities	18,207,596,005	17,480,643,235
Alternative investments	20,343,876,329	19,838,883,828
Derivatives	32,220,547	3,427,917
Short-term investments	1,280,712,915	1,223,393,259
Foreign currency	<u>68,446,828</u>	<u>81,744,713</u>
Total investments	<u>\$52,070,945,762</u>	<u>\$49,180,275,900</u>
Invested securities lending collateral	2,323,876,849	3,268,211,165
Capital assets, net of accumulated depreciation	2,851,122	2,913,530
Total assets	\$60,286,466,038	\$62,549,323,933
Less accounts payable:		
Benefits and refunds payable	(\$6,180,128)	(\$8,523,543)
Administrative and investment expenses payable	(61,859,989)	(42,699,505)
Pending investment purchases	(5,925,019,878)	(9,854,244,522)
Securities lending collateral	<u>(2,323,859,349)</u>	<u>(3,268,191,845)</u>
Total accounts payable	(\$8,316,919,344)	(\$13,173,659,415)
Net assets at market value	<u>\$51,969,546,694</u>	<u>\$49,375,664,518</u>

SECTION 3: Supplemental Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT J

History of System Revenue and Expenses

Year Ending June 30	Market Value of Assets Beginning of Year	Member Contributions	Employer Contributions	Net Investment Return	Admin Expenses	Benefit Payments	Market Value of Assets End of Year	Investment Return*
2009	\$38,430,723,287	\$876,182,122	\$1,603,920,569	(\$8,654,702,712)	\$17,387,936	\$3,707,423,088	\$28,531,312,242**	(22.7%)
2010	28,531,312,242	899,401,027	2,252,149,605	3,679,642,960	16,950,679	3,988,188,142	31,323,784,214	12.9%
2011	31,323,784,214	909,577,109	2,326,028,622	7,234,539,490	17,792,071	4,304,870,170	37,471,267,194	23.6%
2012	37,471,267,194	917,661,328	2,561,259,102	224,106,719	19,011,899	4,638,457,105	36,516,825,339	0.8%
2013	36,516,825,339	921,422,657	2,860,491,456	4,561,768,383	20,257,553	4,981,481,783	39,858,768,499	12.7%
2014	39,858,768,499	928,745,853	3,596,717,490	6,782,031,720	21,218,069	5,320,662,979	45,824,382,514	17.2%
2015	45,824,382,514	935,451,049	3,523,256,530	1,770,549,533	21,686,860	5,625,037,173	46,406,915,593	3.9%
2016	46,406,915,593	951,809,398	3,890,510,012	(44,103,178)	22,967,917	5,931,207,177	45,250,956,731	(0.1%)
2017	45,250,956,731	929,130,165	4,135,859,276	5,520,453,001	22,728,735	6,438,005,920	49,375,664,518	12.4%
2018	49,375,664,518	938,037,245	4,179,758,475	4,049,271,728	21,550,896	6,551,634,376	51,969,546,694	8.3%

* Calculated by the actuary and may not match the investment return reported in the Comprehensive Annual Financial Report.

**Subsequent to the valuation, the market value as of June 30, 2009 was determined to be \$28,497,729,443.

SECTION 3: Supplemental Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT K

Development of Unfunded Actuarial Accrued Liability

	Year Ending June 30	
	2018	2017
1. Unfunded actuarial accrued liability at beginning of year	\$73,436,509,059	\$71,407,792,496
2. Total normal cost at beginning of year	1,929,676,002	1,917,029,641
3. Total member and employer contributions*	5,116,687,815	5,063,662,107
4. Interest on:		
(a) Unfunded actuarial accrued liability and normal cost	5,275,632,954	5,132,737,550
(b) Total contributions	<u>179,084,074</u>	<u>177,228,174</u>
(c) Total interest: (4a) – (4b)	<u>5,096,548,880</u>	<u>4,955,509,376</u>
5. Expected unfunded actuarial accrued liability: (1) + (2) – (3) + (4c)	\$75,346,046,126*	\$73,216,669,406
6. Changes due to (gain)/loss from:		
(a) Investments	(306,966,173)	(384,476,850)
(b) Demographics	<u>1,342,002,050</u>	<u>604,316,503</u>
(c) Total changes due to (gain)/loss: (6a) + (6b)	<u>1,035,035,877</u>	<u>219,839,653</u>
7. Change due to new buyout provisions	(380,955,376)	0
8. Change in actuarial assumptions	<u>(711,686,423)</u>	<u>0</u>
9. Unfunded actuarial accrued liability at end of year: (5) + (6c) + (7) + (8)	\$75,288,440,204	<u>\$73,436,509,059</u>

* Excludes guaranteed minimum annuity contributions, excess sick leave contributions, and penalty contributions.

** The unfunded actuarial accrued liability increased \$1,909,537,067 during the year ended June 30, 2018 due to total contributions being less than total normal cost plus interest on the unfunded actuarial accrued liability.

SECTION 4: Reporting Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT I

Derivation of Employer Contributions under Illinois Pension Code

	June 30, 2020	As Percentage of Payroll (Federal, Total)	
1. Assumed Payroll:			
a. Total payroll	\$10,954,583,571		
b. Less Federal Funds payroll	<u>(219,091,671)</u>		
c. State payroll	\$10,735,491,900		
2. Employer contribution that would have been required without funds provided by Sec. 7.2(d) of General Obligation Bond Act			
a. Employer's cost	\$5,439,221,532	49.65%	Total
b. Less School Districts' contributions under Sec. 16-158	(87,086,402)	(0.79%)	Total
c. Less State debt service for TRS portion of all funds provided under Sec 7.2 of General Obligation Bond Act	<u>(399,198,690)</u>	<u>(3.65%)</u>	Total
d. Maximum State and Federal Funds contribution under PA 94-0004	\$4,952,936,440	45.21%	Total
3. Employer contribution recognizing all system assets, before limiting State and Federal Funds contribution			
a. Employer's cost	\$5,130,455,469	46.83%	Total
b. Less School Districts' contributions under Sec. 16-158	<u>(87,086,402)</u>	<u>(0.79%)</u>	Total
c. State and Federal Funds contribution	\$5,043,369,067	46.04%	Total
4. State and Federal Funds contribution under PA 100-0023			
a. Lesser of amounts under (2) and (3)	\$4,952,936,440	45.21%	Total
b. Less phase-in of the effect of assumption changes	(116,503,572)	(1.06%)	Total
c. Less Federal Funds contribution under PA 100-0340	<u>(23,355,172)</u>	<u>(10.66%)</u>	Federal
d. State contribution	\$4,813,077,696	43.94%	Total
5. Employer contributions			
a. State contribution	\$4,813,077,696	43.94%	Total
b. Plus Federal Funds contribution	23,355,172	10.66%	Federal
c. Plus School Districts' contributions under Sec. 16-158(e)	63,536,585	0.58%	Total
d. Plus School Districts' contributions under Sec. 16-158(f)	20,435,968	0.19%	Total
e. Plus School Districts' contributions under Sec. 16-158(i-5)	<u>3,113,849</u>	<u>0.03%</u>	Total
f. Total employer contribution	\$4,923,519,270	44.94%	Total

Notes about employer contributions:

1) Assumed Payrolls

TRS staff estimated that Federal Funds payroll for the fiscal year ending June 30, 2020 would be 2.00% of total payroll.

2) Determination of Maximum State and Federal Funds Contribution under Public Act 94-0004

Under Section 7.2(d) of the General Obligation Bond Act (GOBA), TRS received \$4.33 billion on July 2, 2003. Commencing with fiscal year 2005, the maximum State contribution under the Act equals the State contribution that would have been required had the \$4.33 billion contribution not been made, reduced, but not below zero, by the State's debt service on the TRS portion of the full \$10 billion of Pension Obligation Bonds issued under Section 7.2 of the GOBA.

3) Employer Contribution Recognizing \$4.33 Billion Received July 2, 2003

A gross employer contribution is determined that recognizes all System assets, and that meets the cost of maintaining and administering the System on a 90% funded basis by June 30, 2045, with a level percentage of payroll contribution after a 15-year phase-in beginning in fiscal year 1996.

4) State and Federal Funds Contribution under Public Act 100-0023

The State and Federal Funds contribution is the lesser of the maximum contribution determined under (2) or the contribution determined under (3), adjusted to reflect the phase-in of the effect of assumption changes. In accordance with Public Act 100-0340, the Federal Funds contribution rate is equal to the employer normal cost rate.

5) Employer Contributions

The required employer contribution equals the sum of the State, Federal, and School Districts' contributions. For fiscal year 2020, the expected School Districts' contributions under Sec. 16-158(e), 16-158(f), and 16-158(i-5) are \$63,536,585, \$20,435,968, and \$3,113,849, respectively.

6) State Contribution Amount for FY 2006 and FY 2007 under Public Act 94-0004

PA 94-0004 specified actual contribution amounts for fiscal years 2006 and 2007 made by the State to the Benefit Trust Reserve.

SECTION 4: Reporting Information for the Teachers' Retirement System of the State of Illinois

Notes about employer contributions (continued):

Additional information:

The following contributions made to the Benefit Trust Reserve are not shown on Exhibit I:

a) From Members:

- i) Sec. 16-128 payments for the purchase of optional service credit
- ii) Sec. 16-152 career contributions of 9.0% of salary

b) From School Districts:

- i) Sec. 16-128(d-10) payments for excessive sick leave service credit

Although these types of contributions are not shown in the exhibits, they are all, with the exception of Sec. 16-128(d-10) payments and Sec. 16-128 member payments for the purchase of optional service credit, taken into account in the actuarial projection of the assets and funded status of the system. The actuarial projection is performed after the above contributions have been taken into account.

Payments under Sec. 16-158(f) have been included since the recertified June 30, 2004, valuation. There are no current assumptions for excessive sick leave service credit, and therefore the actuarial projections do not currently include projected payments under Sec. 16-128(d-10).

The projected School Districts' contributions under Sec. 16-158(f) reflect a phase-in of the effect of the threshold changing from 6% to 3% to estimate the impact of when current collective bargaining agreements will expire. In addition, the projected School Districts' contributions under Sec. 16-158(f) assume that the threshold changing from 6% to 3% will not alter the salary increases provided to members nearing retirement. This is consistent with the individual salary increase assumption. To the extent that school districts reduce salary increases for members nearing retirement to avoid the additional costs, the lower school district contributions under Sec. 16-158(f) will be offset by lower liabilities as a result of salary increases being lower than expected.

SECTION 4: Reporting Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT II

Development of State and Federal Funds Statutory Contributions under Illinois Pension Code

	Fiscal Year Ending June 30, 2020
1. Present value as of June 30, 2019 of future obligations to fund:	
a. 90% of June 30, 2045 Actuarial Accrued Liability	\$32,222,798,398
b. Benefit disbursements and administrative expenses through June 30, 2045	<u>121,603,214,083</u>
c. Total	\$153,826,012,481
2. Projected actuarial value of assets as of June 30, 2019	
a. With POB proceeds	53,829,658,052
b. Without POB proceeds	48,809,845,644
3. Present value as of June 30, 2019 of future member contributions through June 30, 2045	16,028,626,551
4. Present value as of June 30, 2019 of future School district contributions through June 30, 2045	
a. 2.2% formula under §16-158(e)	\$1,032,955,933
b. 3% / 6% FAS cap increases under §16-158(f)	887,673,494
c. Salaries above the Governor's under §16-158(i-5)	<u>53,739,428</u>
d. Total	\$1,974,368,855
5. Present value as of June 30, 2019 of future State and Federal Funds contributions through June 30, 2045	
a. Including POB proceeds: (1c) – (2a) – (3) – (4d)	81,993,359,023
b. Excluding POB proceeds: (1c) – (2b) – (3) – (4d)	87,013,171,431
6. Present value as of June 30, 2019 of future covered payroll through June 30, 2045	178,095,850,563
7. Determination of preliminary contribution rates for State and Federal Funds for year ended June 30, 2020	
a. Including POB proceeds: (5a) / (6)	46.04%
b. Excluding POB proceeds: (5b) / (6)	48.86%

SECTION 4: Reporting Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT II (continued)

Development of State and Federal Funds Statutory Contributions under Illinois Pension Code

	Fiscal Year Ending June 30, 2020
8. Determination of contribution for State and Federal Funds for year ending June 30, 2020:	
a. Projected payroll:	
i) State	\$10,735,491,900
ii) Federal Funds	<u>219,091,671</u>
iii) Total	\$10,954,583,571
b. State and Federal Funds contribution before maximum:	
i) Gross contribution: (7a) x (8a)(iii)	\$5,043,369,067
ii) Phase-in of the effect of assumption changes	<u>116,503,572</u>
iii) Net contribution: (i) – (ii)	\$4,926,865,495
c. State and Federal Funds contribution maximum:	
i) Gross maximum: (7b) x (8a)(iii)	\$5,352,135,130
ii) State's debt service	399,198,690
iii) Phase-in of the effect of assumption changes	<u>116,503,572</u>
iv) Net contribution: (i) – (ii) – (iii)	\$4,836,432,868
e. State and Federal Funds contribution after maximum:	
i) Total dollar contribution: minimum of (8b)(iii) and (8c)(iv)	\$4,836,432,868
ii) Federal Funds contribution	<u>23,355,172</u>
iii) State contribution: (i) – (ii)	\$4,813,077,696

SECTION 4: Reporting Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT III

Development of State and Federal Funds Contributions Based on Board-Adopted Actuarial Funding Policy

	Fiscal Year Ending June 30, 2020
1. Projected employer Normal Cost for year ending June 30, 2020	
a. Total	\$2,054,320,035
b. Administrative expenses	28,833,052
c. Member contributions	<u>985,912,521</u>
d. Employer Normal Cost: (a) + (b) – (c)	\$1,097,240,566
2. Projected Unfunded Actuarial Accrued Liability as of June 30, 2019	
a. Actuarial Accrued Liability	\$134,021,531,564
b. Actuarial Value of Assets	<u>53,829,658,052</u>
c. Unfunded Actuarial Accrued Liability: (a) – (b)	\$80,191,873,512
3. Payment toward projected Unfunded Actuarial Accrued Liability for year ending June 30, 2020 (see Exhibit IV)	6,891,371,717
4. Total employer contribution for year ending June 30, 2020: (1d) + (3)	\$7,988,612,283
5. Projected School district contributions for year ending June 30, 2020	
a. 2.2% formula under §16-158(e)	\$63,536,585
b. 3% / 6% FAS cap increases under §16-158(f)	20,435,968
c. Salaries above the Governor's under §16-158(i-5)	<u>3,113,849</u>
d. Total	\$87,086,402
6. Federal Funds contribution for year ending June 30, 2020	23,355,172
7. State contribution for year ending June 30, 2020: (4) – (5d) – (6)	\$7,878,170,709

SECTION 4: Reporting Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT IV

Components of Unfunded Liability Bases and Amortization Payment under Board-Adopted Actuarial Funding Policy

	Original Amount	Balance as of June 30, 2019	Remaining Amortization Period	2020 Amortization
June 30, 2015 valuation base:				
Projected UAAL as of June 30, 2016	\$68,126,860,208	\$65,448,124,611	17	\$5,682,493,481
June 30, 2016 valuation base:				
Projected (gain)/loss as of June 30, 2017	\$8,625,889,107	8,412,466,986	18	704,205,696
June 30, 2017 valuation base:				
Projected (gain)/loss as of June 30, 2018	\$3,216,359,048	3,180,437,329	19	257,430,509
June 30, 2018 valuation base:				
Projected (gain)/loss as of June 30, 2019	\$3,150,844,586	<u>3,150,844,586</u>	20	<u>247,242,031</u>
Total		\$80,191,873,512		\$6,891,371,717

SECTION 4: Reporting Information for the Teachers' Retirement System of the State of Illinois

**EXHIBIT V
Components of Phase-in of the Effect of Assumption Changes**

Valuation Date June 30	Fiscal Year State Contribution First Affected	Effect on State Contribution	Phase in of the Effect of Assumption Changes for Fiscal Year				
			2019	2020	2021	2022	2023
2012	2014	\$335,329,627	--	--	--	--	--
2013	2015	--	--	--	--	--	--
2014	2016	464,263,256	(\$92,852,651)	--	--	--	--
2015	2017	42,517,859	(17,007,144)	(\$8,503,572)	--	--	--
2016	2018	410,000,000	(246,000,000)	(164,000,000)	(\$82,000,000)	--	--
2017	2019	--	--	--	--	--	--
2018	2020	(70,000,000)	<u>N/A</u>	<u>56,000,000</u>	<u>42,000,000</u>	<u>\$28,000,000</u>	<u>\$14,000,000</u>
Total			(\$355,859,795)	(\$116,503,572)	(\$40,000,000)	\$28,000,000	\$14,000,000

SECTION 4: Reporting Information for the Teachers' Retirement System of the State of Illinois

**EXHIBIT VI
10-Year History of Unfunded Actuarial Liability and Funded Ratio (\$ in thousands)**

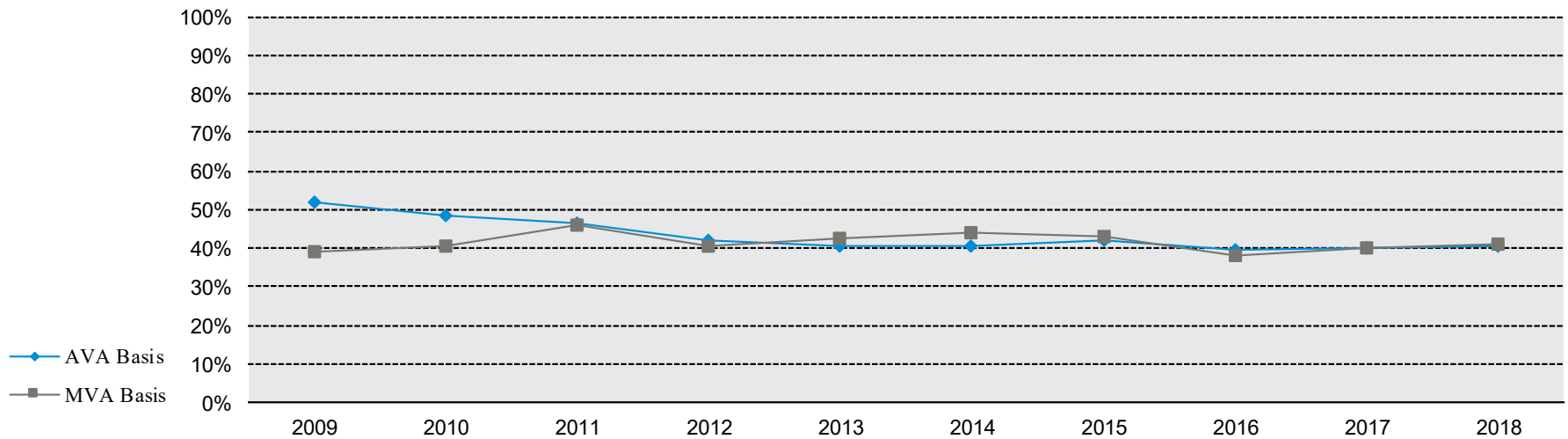
As of June 30	Assets			Unfunded Liability Using Assets Based on		Funded Ratio Using Assets Based on	
	Actuarial Accrued Liability	Actuarial Value of Assets	Market Value of Assets	Actuarial Value of Assets	Market Value of Assets	Actuarial Value of Assets	Market Value of Assets
2009	\$73,027,198	\$38,026,044	\$28,497,729	\$35,001,154	\$44,529,469	52.1%	39.0%
2010	77,293,198	37,439,092	31,323,784	39,854,106	45,969,414	48.4	40.5
2011	81,299,745	37,769,753	37,471,267	43,529,992	43,828,478	46.5	46.1
2012	90,024,945	37,945,397	36,516,825	52,079,548	53,508,120	42.1	40.6
2013	93,886,989	38,155,191	39,858,768	55,731,798	54,028,220	40.6	42.5
2014	103,740,377	42,150,765	45,824,383	61,589,612	57,915,994	40.6	44.2
2015	108,121,825	45,435,193	46,406,916	62,686,632	61,714,909	42.0	42.9
2016	118,629,890	47,222,098	45,250,957	71,407,792	73,378,934	39.8	38.1
2017	122,904,034	49,467,525	49,375,665	73,436,509	73,528,370	40.2	40.2
2018	127,019,330	51,730,890	51,969,547	75,288,440	75,049,783	40.7	40.9

SECTION 4: Reporting Information for the Teachers' Retirement System of the State of Illinois

**EXHIBIT VII
Funded Ratio**

A critical piece of information regarding the System's financial status is the funded ratio. This ratio compares the actuarial value and market value of assets to the actuarial accrued liabilities of the System as calculated. High ratios indicate a well-funded plan with assets sufficient to cover the plan's actuarial accrued liabilities. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other factors.

The chart below depicts a history of the funded ratios for this System.



SECTION 4: Reporting Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT VIII

Department of Insurance Information

	June 30, 2018	June 30, 2017
Actuarial Accrued Liabilities:		
Service Retirement	\$80,167,438,394	\$78,294,683,525
Disability Retirement	411,635,586	420,772,598
Survivor	<u>2,389,390,585</u>	<u>2,166,896,542</u>
Subtotal	\$82,968,464,565	\$80,882,352,665
Inactive	3,161,375,282	3,402,129,006
Active	<u>40,889,490,317</u>	<u>38,619,552,597</u>
Total	\$127,019,330,164	\$122,904,034,268
Headcounts and Salaries for Active Members:		
Male		
Count	37,491	37,430
Salaries	\$2,616,328,245	\$2,577,047,700
Female		
Count	122,934	122,155
Salaries	\$7,146,064,315	\$7,028,413,220
Total		
Count	160,425	159,585
Salaries	\$9,762,392,560	\$9,605,460,920

SECTION 4: Reporting Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT IX

Roll Forward of Actuarial Accrued Liability and Normal Cost

Actuarial Accrued Liabilities Developed for June 30, 2018 Valuation	Amount
1. Actuarial Accrued Liability measured as of June 30, 2017	\$123,072,855,970
2. Normal Cost measured for fiscal year ended June 30, 2018	1,983,093,442
3. Expected benefit payments for fiscal year ended June 30, 2018	6,560,904,065
4. Interest on 1., 2. and 3. to June 30, 2018	8,524,284,817
5. Actuarial Accrued Liability as of June 30, 2018 (1) + (2) – (3) + (4)	\$127,019,330,164
6. Normal Cost measured for fiscal year ended June 30, 2019	2,024,706,469
7. Expected benefit payments for fiscal year ended June 30, 2019	7,392,298,017*
8. Interest on 5., 6. and 7. to June 30, 2019	8,774,352,134
9. Actuarial Accrued Liability as of June 30, 2019 (5) + (6) – (7) + (8)	\$130,426,090,751

Based on member census as of June 30, 2017, assumptions and methods as of June 30, 2018, including the Projected Unit Credit actuarial cost method.

** Includes \$547,801,405 of projected buyout amounts expected to be paid via additional state funds not included in the FY2019 State contribution amount.*

SECTION 4: Reporting Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT X

State's Share of the Contribution to TRS Necessary to Fund Normal Cost Plus Interest on the Unfunded Actuarial Accrued Liability (UAAL)

	Fiscal Year 2020
1. Employer normal cost plus interest on UAAL	
a. Employer normal cost	\$1,167,213,754
b. Interest on the projected June 30, 2019 UAAL	<u>5,207,156,462</u>
c. Total employer normal cost plus interest on UAAL	\$6,374,370,216
2. Contributions from sources other than State and Federal Funds	
a. School District contributions under §16-158(e)	(\$63,536,585)
b. School District contributions under §16-158(f)	(20,435,968)
c. School District contributions under §16-158(i-5)	<u>(3,113,849)</u>
d. Total contributions from sources other than State and Federal Funds	(\$87,086,403)
3. State and Federal Funds share of normal cost plus interest on UAAL	
a. State's share	\$6,263,928,641
b. Federal Fund's share	<u>23,355,172</u>
c. Total share	\$6,287,283,813
4. State contribution requirement	
a. State's share of normal cost plus interest on UAAL	\$6,263,928,641
b. Guaranteed Minimum Annuity Reserve contribution	<u>500,000</u>
c. Total State contribution requirement	\$6,264,428,641

SECTION 4: Reporting Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT XI

Development of Actuarially Determined Contribution (ADC)

	Fiscal Year Ended June 30, 2018
Development of the ADC:	
1. Employer Normal Cost	\$942,060,492
2. Amortization of Unfunded Actuarial Accrued Liability	<u>6,138,695,864</u>
3. Actuarially Determined Contribution: (1) + (2)	<u>\$7,080,756,356</u>

The ADC for fiscal year ending June 30, 2018, is based on the valuation date of June 30, 2016, prepared by Segal Consulting.

Actuarial Cost Method	Entry Age Normal
Amortization Method	Layered
Amortization Period	20 years
Payroll Growth Assumption	2% (assumed rate of future State revenue growth)
Asset Valuation Method	5-Year Smoothing
Investment Rate of Return	7.00%
Projected Salary Increases	3.25% – 9.25%; composite approximately 4.44%
Includes Inflation at:	2.50%
Post-retirement Increase:	Tier I 3% compounded Tier II 1.25% not compounded (lesser of 3% or 1/2 CPI increase, but not less than zero)

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

Projections – Overview

Based on the results of the June 30, 2018, actuarial valuation, we have projected valuation results to June 30, 2046 commencing with Fiscal Year 2019.

Our projections of contributions, liabilities, and assets are based on the actuarial assumptions, membership data and benefit provisions that were used for the regular actuarial valuation.

In order to determine projected contributions, liabilities, and assets, certain calculations needed to be made that are not normally required in a regular actuarial valuation. Benefit payout requirements, actuarial liabilities, and payroll were estimated over the period from 2019 through 2046 by projecting the membership of TRS over the period, taking into account the impact of new entrants into the System.

To make the required projections, assumptions needed to be made regarding the age and salary distribution of new entrants as well as the size of the active membership of TRS. The assumptions regarding the profile of new entrants to TRS were based on the recent experience of TRS with regard to new entrants. The size of the active membership of the System was assumed to remain constant over the projection period. The results of our projections are shown on the following pages.

The assets haven been allocated by Tier for illustration purposes. Estimated Tier II assets were initially based on the June 30, 2013, accumulated member contributions of \$70,783,523, and have been rolled forward each year with expected member contributions, expected benefit payments, and the proportionate share of investment earnings.

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 1
Projections – Projection of Funded Ratio to 2046

Amounts above the line are based on prior valuations and amounts below the line are based on the current valuation.

Year Ended June 30	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Tier I Funded Ratio	Tier II Funded Ratio	Total Funded Ratio
1995	\$23,980,566,000	\$12,641,865,000	(\$11,338,701,000)			52.7%
1996	26,141,794,000	13,829,711,000	(12,312,083,000)			52.9%
1997	26,951,585,000	17,393,108,000	(9,558,477,000)			64.5%
1998	29,908,241,000	19,965,887,000	(9,942,354,000)			66.8%
1999	33,205,513,000	22,237,709,000	(10,967,804,000)			67.0%
2000	35,886,404,000	24,481,413,000	(11,404,991,000)			68.2%
2001	39,166,697,000	23,315,646,000	(15,851,051,000)			59.5%
2002	43,047,674,000	22,366,285,000	(20,681,389,000)			52.0%
2003	46,933,432,000	23,124,823,000	(23,808,609,000)			49.3%
2004	50,947,451,000	31,544,729,000	(19,402,722,000)			61.9%
2005	56,075,029,000	34,085,218,000	(21,989,811,000)			60.8%
2006	58,996,913,000	36,584,889,000	(22,412,024,000)			62.0%
2007	65,648,395,000	41,909,318,000	(23,739,077,000)			63.8%
2008	68,632,367,000	38,430,723,000	(30,201,644,000)			56.0%
2009	73,027,198,000	38,026,043,512	(35,001,154,488)			52.1%
2010	77,293,198,000	37,439,091,771	(39,854,106,229)			48.4%
2011	81,299,745,000	37,769,752,971	(43,529,992,029)			46.5%
2012	90,024,945,000	37,945,397,211	(52,079,547,789)			42.1%
2013	93,886,988,785	38,155,191,497	(55,731,797,288)			40.6%
2014	103,740,377,267	42,150,765,261	(61,589,612,006)	40.6%	120.5%	40.6%
2015	108,121,825,171	45,435,192,645	(62,686,632,526)	41.9%	162.8%	42.0%
2016	118,629,890,305	47,222,097,809	(71,407,792,496)	39.6%	153.9%	39.8%
2017	122,904,034,268	49,467,525,209	(73,436,509,059)	40.0%	144.0%	40.2%
2018	127,019,330,164	51,730,889,960	(75,288,440,204)	40.4%	130.9%	40.7%
2019	130,426,090,751	53,434,563,056	(76,991,527,695)	40.6%	129.0%	41.0%
2020	134,278,711,488	55,856,303,687	(78,422,407,802)	41.1%	128.0%	41.6%

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 1 (continued)

Projections – Projection of Funded Ratio to 2046

Year Ended June 30	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Tier I Funded Ratio	Tier II Funded Ratio	Total Funded Ratio
2021	\$138,146,475,669	\$59,192,745,389	(\$78,953,730,280)	42.3%	128.6%	42.8%
2022	142,146,065,846	62,254,924,954	(79,891,140,893)	43.1%	128.2%	43.8%
2023	146,160,093,884	65,263,613,595	(80,896,480,289)	43.8%	127.8%	44.7%
2024	150,185,665,348	68,361,643,688	(81,824,021,659)	44.5%	127.4%	45.5%
2025	154,213,327,522	71,574,055,060	(82,639,272,462)	45.2%	126.9%	46.4%
2026	158,230,021,232	74,922,558,288	(83,307,462,944)	46.0%	126.5%	47.4%
2027	162,211,580,405	78,407,139,744	(83,804,440,661)	46.8%	126.1%	48.3%
2028	166,137,865,932	82,009,310,959	(84,128,554,973)	47.6%	125.7%	49.4%
2029	169,996,219,907	85,743,172,397	(84,253,047,509)	48.4%	125.4%	50.4%
2030	173,767,938,719	89,602,759,778	(84,165,178,942)	49.2%	125.1%	51.6%
2031	177,430,727,470	93,593,128,854	(83,837,598,617)	50.1%	124.8%	52.7%
2032	180,962,436,783	97,738,487,416	(83,223,949,368)	51.1%	124.5%	54.0%
2033	184,339,527,409	102,061,280,381	(82,278,247,028)	52.1%	124.3%	55.4%
2034	187,542,937,827	107,197,742,890	(80,345,194,937)	53.5%	124.1%	57.2%
2035	190,552,378,237	112,576,179,842	(77,976,198,394)	55.1%	123.8%	59.1%
2036	193,359,157,937	118,222,623,626	(75,136,534,311)	56.8%	123.7%	61.1%
2037	195,947,321,718	124,169,936,110	(71,777,385,608)	58.6%	123.5%	63.4%
2038	198,291,590,701	130,439,968,924	(67,851,621,777)	60.7%	123.3%	65.8%
2039	200,396,328,881	137,082,420,625	(63,313,908,256)	62.9%	123.2%	68.4%
2040	202,228,042,005	144,109,767,943	(58,118,274,062)	65.4%	123.0%	71.3%
2041	203,791,233,198	151,565,770,980	(52,225,462,218)	68.2%	122.9%	74.4%
2042	205,102,951,321	159,514,369,326	(45,588,581,995)	71.3%	122.7%	77.8%
2043	206,196,138,621	168,030,143,682	(38,165,994,939)	74.9%	122.6%	81.5%
2044	207,117,483,357	177,204,011,632	(29,913,471,724)	78.9%	122.4%	85.6%
2045	207,921,291,699	187,129,162,529	(20,792,129,170)	83.5%	122.2%	90.0%
2046	208,677,285,730	187,809,557,157	(20,867,728,573)	82.7%	122.0%	90.0%

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 2

Projections – Projection of Contributions to Trust to 2046 (Dollars)

Amounts above the line are based on prior valuations and amounts below the line are based on the current valuation. See notes.

Year Ended June 30	Member	School District Contributions				Federal Funds	State	Total
		§16-158(e) (2.2 Formula)	§16-158(f) (3%/6% FAS Cap)	§16-158(i-5) (Payroll above Gov.)	Total *			
1995	\$421,726,521	-	-	-	-	\$16,500,000	\$262,864,800	\$701,091,321
1996	422,238,847	-	-	-	-	17,000,000	324,276,242	763,515,089
1997	420,762,625	-	-	-	-	17,300,000	377,968,984	816,031,609
1998	440,967,595	-	-	-	-	18,000,000	460,439,267	919,406,862
1999	866,369,000	\$16,675,000	-	-	\$16,675,000	18,500,000	567,067,600	1,468,611,600
2000	619,622,000	34,145,066	-	-	34,145,066	18,200,000	634,038,560	1,306,005,626
2001	643,563,000	36,375,498	-	-	36,375,498	20,000,000	719,356,841	1,419,295,339
2002	681,151,770	38,664,380	-	-	38,664,380	23,000,000	810,618,724	1,553,434,874
2003	732,020,451	12,808,373	-	-	12,808,373	25,000,000	926,049,918	1,695,878,742
2004	768,661,300	42,604,912	-	-	42,604,912	29,400,000	1,027,258,994	1,867,925,206
2005	761,790,009	44,481,074	-	-	44,481,074	37,860,000	902,243,532	1,746,374,615
2006	799,034,336	45,656,648	\$14,974,781	-	60,631,429	24,070,387	531,827,700	1,415,563,852
2007	826,249,007	46,047,720	19,353,893	-	225,741,253	41,328,022	735,514,500	1,828,832,782
2008	865,400,168	48,102,405	-	-	131,239,475	47,829,058	1,039,194,988	2,083,663,689
2009	876,182,122	51,141,422	3,000,000	-	148,460,852	55,707,046	1,449,888,800	2,530,238,820
2010	909,642,774	53,666,271	3,000,000	-	145,878,411	75,718,545	2,087,668,469	3,218,908,199
2011	948,286,581	56,171,181	5,000,000	-	147,747,541	75,405,839	2,357,040,597	3,528,480,558
2012	976,364,866	57,976,440	5,000,000	-	147,745,130	84,654,093	2,405,172,175	3,613,936,264
2013	967,910,390	57,610,031	5,000,000	-	133,102,941	83,575,603	2,702,277,829	3,886,866,763
2014	1,004,368,089	57,896,194	5,000,000	-	124,446,854	97,203,752	3,437,478,152	4,663,496,847
2015	1,045,996,125	60,413,797	5,782,580	-	124,562,387	25,074,310	3,411,877,643	4,607,510,465
2016	1,041,807,455	61,478,785	5,027,434	-	124,554,918	80,263,377	3,741,802,194	4,988,427,944
2017	1,034,264,612	61,138,899	2,190,130	-	63,329,029	77,196,619	3,985,783,351	5,160,573,611
2018	939,719,161	60,559,679	4,295,624	\$2,477,050	67,332,353	21,091,475	4,094,616,146	5,122,759,135
2019	958,472,559	61,768,232	4,150,160	2,385,898	68,304,290	20,979,899	4,353,323,925	5,401,080,673
2020	985,912,521	63,536,585	20,435,968	3,113,849	87,086,403	23,355,172	4,813,077,696	5,909,431,792

* School District contributions under Sec. 16-133.2 are included in the total School District contributions for years 2007 – 2016, which can be found in the June 30, 2016 valuation report. These contributions no longer apply because the ERO was discontinued at the end of fiscal year 2016.

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 2 (continued)

Projections – Projection of Contributions to Trust to 2046 (Dollars)

Year Ended June 30	Member	Contributions						
		School District			Total *	Federal Funds	State	Total
		§16-158(e) (2.2 Formula)	§16-158(f) (3%/6% FAS Cap)	§16-158(i-5) (Payroll above Gov.)				
2021	\$1,018,750,799	\$65,652,829	\$36,884,797	\$3,324,922	\$105,862,548	\$23,295,435	\$5,075,930,253	\$6,223,839,036
2022	1,052,486,442	67,826,904	53,660,391	3,607,621	125,094,916	23,224,867	5,311,640,447	6,512,446,673
2023	1,087,040,307	70,053,709	64,690,785	3,907,150	138,651,644	23,093,567	5,422,132,084	6,670,917,603
2024	1,120,843,391	72,232,130	71,333,788	4,217,529	147,783,446	22,915,020	5,548,076,570	6,839,618,428
2025	1,155,236,987	74,448,606	73,040,296	4,588,179	152,077,081	22,693,989	5,703,699,696	7,033,707,753
2026	1,190,245,694	76,704,722	75,478,165	4,905,486	157,088,373	22,376,619	5,879,807,969	7,249,518,655
2027	1,225,813,680	78,996,882	79,779,262	5,198,733	163,974,877	21,901,204	6,060,611,286	7,472,301,047
2028	1,261,319,841	81,285,056	82,443,505	5,534,650	169,263,211	21,330,320	6,227,889,453	7,679,802,826
2029	1,298,322,568	83,669,677	83,549,252	5,775,785	172,994,714	20,657,755	6,405,635,266	7,897,610,302
2030	1,336,005,515	86,098,133	86,962,269	5,956,929	179,017,331	19,861,949	6,574,655,633	8,109,540,428
2031	1,374,474,675	88,577,257	89,434,965	6,195,048	184,207,270	18,967,751	6,751,049,094	8,328,698,789
2032	1,413,731,651	91,107,151	91,933,780	6,273,432	189,314,363	17,938,684	6,949,655,804	8,570,640,503
2033	1,453,445,477	93,666,486	94,650,263	6,247,673	194,564,422	16,795,370	7,167,908,755	8,832,714,024
2034	1,493,551,008	96,251,065	94,005,969	6,121,058	196,378,092	15,532,930	7,994,320,835	9,699,782,866
2035	1,534,455,620	98,887,140	94,937,583	5,828,264	199,652,987	14,185,190	8,215,038,360	9,963,332,157
2036	1,576,252,571	101,580,721	93,379,088	5,493,887	200,453,697	12,785,160	8,440,593,751	10,230,085,179
2037	1,619,466,403	104,365,613	94,545,783	5,109,663	204,021,058	11,300,277	8,673,832,667	10,508,620,405
2038	1,663,404,188	107,197,159	96,008,504	4,615,113	207,820,776	9,684,709	8,911,084,803	10,791,994,476
2039	1,707,410,122	110,033,097	96,043,331	3,975,088	210,051,516	7,929,971	9,148,841,588	11,074,233,198
2040	1,751,069,581	112,846,706	96,182,638	3,218,360	212,247,704	6,070,375	9,384,845,101	11,354,232,760
2041	1,794,566,816	115,649,862	91,167,593	2,357,187	209,174,642	4,227,202	9,619,962,192	11,627,930,852
2042	1,838,599,577	118,487,528	86,196,082	1,476,080	206,159,690	2,492,324	9,857,842,986	11,905,094,576
2043	1,882,766,309	121,333,829	79,370,048	587,961	201,291,838	920,464	10,096,279,251	12,181,257,862
2044	1,926,997,600	124,184,290	72,665,909	-	196,850,199	-	10,334,410,338	12,458,258,136
2045	1,971,434,438	127,047,997	63,088,566	-	190,136,564	-	10,572,723,311	12,734,294,313
2046	2,016,763,056	129,969,175	49,950,194	-	179,919,369	-	1,050,158,328	3,246,840,753

* School District contributions under Sec. 16-133.2 are included in the total School District contributions for years 2007 – 2016, which can be found in the June 30, 2016 valuation report. These contributions no longer apply because the ERO was discontinued at the end of fiscal year 2016.

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 2 (continued)

Projections – Projection of Contributions to Trust to 2046 (Dollars)

Notes

- 1) The administrative staff of the System estimated the Federal Funds contribution for fiscal years prior to 2006. Commencing with the contribution for fiscal 2006, total payroll for the valuation is split into State and Federal Funds payrolls. Federal Funds payrolls for 2006 - 2019 were estimated to be 4.33%, 5.32%, 4.40%, 3.70%, 3.50%, 3.10%, 3.40%, 3.00%, 2.75%, 3.00%, 2.10%, 1.90%, 2.00%, and 2.00%, respectively, of total payrolls for those years. For 2020, the estimate is 2.00% of payroll. All payrolls are assumed to increase at the same rate for years subsequent to 2020.
- 2) School District contributions under Sec. 16-158(e) for years subsequent to 2005 are expected to equal 0.58% of total payroll. Sec. 16-158(f) contributions for 2008 – 2014 were estimated by the administrative staff of the System.
- 3) School District contributions under Sec. 16-133.2 are included in the total School District contributions for years 2007 – 2016, which can be found in the June 30, 2016 valuation report. These contributions no longer apply because the ERO was discontinued at the end of fiscal year 2016.
- 4) Employer Rates, Contribution Amounts, and Assumed Payroll shown for fiscal years 1995 - 2020 are based on the June 30, 1993 - June 30, 2018 actuarial valuations and are certified amounts, with the following exceptions. The 2006 amount is the recertified amount and 2007 is the certified amount required by per PA 94-0004. The 2011 amount is the originally certified amount, not the recertified amount per PA 96-1511. The 2015 amount is the certified amount; however, PA 98-0674 subsequently lowered state contributions and increased federal contributions. The 2017 Sec. 133.2 contribution was removed because ERO was discontinued at the end of fiscal 2016. The 2018 amount is the recertified amount. The 2019 amount is based on a preliminary recertification that may change. Items subsequent to 2019 are based on the June 30, 2018 valuation.
- 5) Schedule excludes State ERI contributions of \$1,000,000 for 2004, and \$1,684,000 for 2005 (under Public Act 92-0056, as amended).
- 6) The projected School Districts' contributions under Sec. 16-158(f) reflect a phase-in of the effect of the threshold changing from 6% to 3% to estimate the impact of when current collective bargaining agreements will expire. In addition, the projected School Districts' contributions under Sec. 16-158(f) assume that the threshold changing from 6% to 3% will not alter the salary increases provided to members nearing retirement. This is consistent with the individual salary increase assumption.

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 3

Projections – Projection of Contributions to Trust to 2046 (Percent of Payroll)

Amounts above the line are based on prior valuations and amounts below the line are based on the current valuation.

Year Ended June 30	Assumed Payroll	Member	Contributions						
			School District			Federal Funds	State	Total	
			§16-158(e) (2.2 Formula)	§16-158(f) (3%/6% FAS Cap)	§16-158(i-5) (Payroll above Gov.)				
1995	\$4,633,650,000	9.10%	0.00%	0.00%	0.00%	0.00%	0.36%	5.67%	15.13%
1996	4,863,544,432	8.68%	0.00%	0.00%	0.00%	0.00%	0.35%	6.67%	15.70%
1997	4,903,151,093	8.58%	0.00%	0.00%	0.00%	0.00%	0.35%	7.71%	16.64%
1998	5,264,732,966	8.38%	0.00%	0.00%	0.00%	0.00%	0.34%	8.75%	17.46%
1999	5,558,349,721	15.59%	0.30%	0.00%	0.00%	0.30%	0.33%	10.20%	26.42%
2000	5,887,080,405	10.53%	0.58%	0.00%	0.00%	0.58%	0.31%	10.77%	22.18%
2001	6,271,637,672	10.26%	0.58%	0.00%	0.00%	0.58%	0.32%	11.47%	22.63%
2002	6,666,272,399	10.22%	0.58%	0.00%	0.00%	0.58%	0.35%	12.16%	23.30%
2003	7,115,762,553	10.29%	0.18%	0.00%	0.00%	0.18%	0.35%	13.01%	23.83%
2004	7,345,674,585	10.46%	0.58%	0.00%	0.00%	0.58%	0.40%	13.98%	25.43%
2005	7,669,150,690	9.93%	0.58%	0.00%	0.00%	0.58%	0.49%	11.76%	22.77%
2006	7,871,835,902	10.15%	0.58%	0.19%	0.00%	0.77%	0.31%	6.76%	17.98%
2007	7,939,262,146	10.41%	0.58%	0.24%	0.00%	2.84%	0.52%	9.26%	23.04%
2008	8,293,518,065	10.43%	0.58%	0.00%	0.00%	1.58%	0.58%	12.53%	25.12%
2009	8,817,486,572	9.94%	0.58%	0.03%	0.00%	1.68%	0.63%	16.44%	28.70%
2010	9,252,805,323	9.83%	0.58%	0.03%	0.00%	1.58%	0.82%	22.56%	34.79%
2011	9,684,686,327	9.79%	0.58%	0.05%	0.00%	1.53%	0.78%	24.34%	36.43%
2012	9,995,937,994	9.77%	0.58%	0.05%	0.00%	1.48%	0.85%	24.06%	36.15%
2013	9,932,764,038	9.74%	0.58%	0.05%	0.00%	1.34%	0.84%	27.21%	39.13%
2014	9,982,102,443	10.06%	0.58%	0.05%	0.00%	1.25%	0.97%	34.44%	46.72%
2015	10,416,171,908	10.04%	0.58%	0.06%	0.00%	1.20%	0.24%	32.76%	44.23%
2016	10,599,790,566	9.83%	0.58%	0.05%	0.00%	1.18%	0.76%	35.30%	47.06%
2017	10,541,189,447	9.81%	0.58%	0.02%	0.00%	0.60%	0.73%	37.81%	48.96%
2018	10,441,324,011	9.00%	0.58%	0.04%	0.02%	0.64%	0.20%	39.22%	49.06%
2019	10,649,695,100	9.00%	0.58%	0.04%	0.02%	0.64%	0.20%	40.88%	50.72%
2020	10,954,583,571	9.00%	0.58%	0.19%	0.03%	0.79%	0.21%	43.94%	53.94%

Note:

Effective with the 2016 valuation, the member contribution rate is equal to the statutory 9% rate because of the elimination of ERO and the assumption for the members' cost of optional service.

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 3 (continued)

Projections – Projection of Contributions to Trust to 2046 (Percent of Payroll)

Year Ended June 30	Assumed Payroll	Member	Contributions						
			School District			Federal Funds	State	Total	
			§16-158(e) (2.2 Formula)	§16-158(f) (3%/6% FAS Cap)	§16-158(i-5) (Payroll above Gov.)				
2021	\$11,319,453,324	9.00%	0.58%	0.33%	0.03%	0.94%	0.21%	44.84%	54.98%
2022	11,694,293,803	9.00%	0.58%	0.46%	0.03%	1.07%	0.20%	45.42%	55.69%
2023	12,078,225,638	9.00%	0.58%	0.54%	0.03%	1.15%	0.19%	44.89%	55.23%
2024	12,453,815,451	9.00%	0.58%	0.57%	0.03%	1.19%	0.18%	44.55%	54.92%
2025	12,835,966,527	9.00%	0.58%	0.57%	0.04%	1.18%	0.18%	44.44%	54.80%
2026	13,224,952,155	9.00%	0.58%	0.57%	0.04%	1.19%	0.17%	44.46%	54.82%
2027	13,620,151,995	9.00%	0.58%	0.59%	0.04%	1.20%	0.16%	44.50%	54.86%
2028	14,014,664,905	9.00%	0.58%	0.59%	0.04%	1.21%	0.15%	44.44%	54.80%
2029	14,425,806,311	9.00%	0.58%	0.58%	0.04%	1.20%	0.14%	44.40%	54.75%
2030	14,844,505,720	9.00%	0.58%	0.59%	0.04%	1.21%	0.13%	44.29%	54.63%
2031	15,271,940,831	9.00%	0.58%	0.59%	0.04%	1.21%	0.12%	44.21%	54.54%
2032	15,708,129,460	9.00%	0.58%	0.59%	0.04%	1.21%	0.11%	44.24%	54.56%
2033	16,149,394,189	9.00%	0.58%	0.59%	0.04%	1.20%	0.10%	44.39%	54.69%
2034	16,595,011,203	9.00%	0.58%	0.57%	0.04%	1.18%	0.09%	48.17%	58.45%
2035	17,049,506,894	9.00%	0.58%	0.56%	0.03%	1.17%	0.08%	48.18%	58.44%
2036	17,513,917,460	9.00%	0.58%	0.53%	0.03%	1.14%	0.07%	48.19%	58.41%
2037	17,994,071,142	9.00%	0.58%	0.53%	0.03%	1.13%	0.06%	48.20%	58.40%
2038	18,482,268,756	9.00%	0.58%	0.52%	0.02%	1.12%	0.05%	48.21%	58.39%
2039	18,971,223,578	9.00%	0.58%	0.51%	0.02%	1.11%	0.04%	48.22%	58.37%
2040	19,456,328,677	9.00%	0.58%	0.49%	0.02%	1.09%	0.03%	48.24%	58.36%
2041	19,939,631,294	9.00%	0.58%	0.46%	0.01%	1.05%	0.02%	48.25%	58.32%
2042	20,428,884,186	9.00%	0.58%	0.42%	0.01%	1.01%	0.01%	48.25%	58.28%
2043	20,919,625,661	9.00%	0.58%	0.38%	0.00%	0.96%	0.00%	48.26%	58.23%
2044	21,411,084,441	9.00%	0.58%	0.34%	0.00%	0.92%	0.00%	48.27%	58.19%
2045	21,904,827,094	9.00%	0.58%	0.29%	0.00%	0.87%	0.00%	48.27%	58.13%
2046	22,408,478,401	9.00%	0.58%	0.22%	0.00%	0.80%	0.00%	4.69%	14.49%

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 4

Projections – Projection of Employer Normal Cost and Amortization Amount to 2046

Amounts above the line are based on prior valuations and amounts below the line are based on the current valuation. See notes.

Year Ended June 30	Amortization Year	Employer Rate			Amount of Employer Contribution		
		Total	Normal Cost	Amortization	Total	Normal Cost	Amortization
1995	0	6.03%	8.12%	-2.09%	\$279,364,800	\$376,122,700	(\$96,757,900)
1996	1	7.02%	8.23%	-1.21%	341,276,242	400,134,055	(58,857,813)
1997	2	8.06%	8.21%	-0.15%	395,268,984	402,771,457	(7,502,473)
1998	3	9.09%	8.38%	0.71%	478,439,267	441,403,004	37,036,263
1999	4	10.83%	7.84%	2.99%	602,242,600	435,910,961	166,331,639
2000	5	11.66%	8.15%	3.51%	686,383,626	479,928,856	206,454,770
2001	6	12.37%	8.65%	3.72%	775,732,339	542,794,806	232,937,533
2002	7	13.09%	8.84%	4.25%	872,283,104	588,971,933	283,311,171
2003	8	13.55%	8.83%	4.72%	963,858,291	628,536,783	335,321,508
2004	9	14.96%	8.15%	6.81%	1,099,263,906	598,462,925	500,800,981
2005	10	12.84%	8.32%	4.52%	984,584,606	637,971,250	346,613,356
2006	11	7.64%	8.20%	-0.56%	601,554,735	645,705,698	(44,150,963)
2007	12	10.36%	8.20%	2.16%	822,890,242	650,835,074	172,055,168
2008	13	13.69%	8.22%	5.47%	1,135,126,451	681,651,502	453,474,949
2009	14	17.66%	9.27%	8.39%	1,556,737,268	817,320,366	739,416,902
2010	15	23.96%	9.15%	14.81%	2,217,053,286	846,936,893	1,370,116,393
2011	16	25.70%	8.77%	16.93%	2,488,617,617	849,716,122	1,638,901,495
2012	17	25.49%	8.43%	17.06%	2,547,802,708	842,532,254	1,705,270,454
2013	18	28.63%	8.23%	20.40%	2,843,463,463	817,433,027	2,026,030,436
2014	19	35.99%	7.89%	28.10%	3,592,578,098	787,230,469	2,805,347,629
2015	20	33.58%	8.02%	25.56%	3,497,365,750	835,810,326	2,661,555,424
2016	21	36.64%	9.36%	27.27%	3,883,544,356	992,489,371	2,891,054,985
2017	22	39.12%	8.27%	30.86%	4,124,118,869	871,335,169	3,252,783,700
2018	23	40.02%	10.10%	29.92%	4,178,744,350	1,054,630,171	3,124,114,179
2019	24	41.72%	9.85%	31.87%	4,442,608,114	1,049,301,284	3,393,306,830
2020	25	44.94%	10.66%	34.29%	4,923,519,270	1,167,213,754	3,756,305,516

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 4 (continued)

Projections – Projection of Employer Normal Cost and Amortization Amount to 2046

Year Ended June 30	Amortization Year	Employer Rate			Amount of Employer Contribution		
		Total	Normal Cost	Amortization	Total	Normal Cost	Amortization
2021	26	45.98%	10.29%	35.69%	\$5,205,088,237	\$1,164,893,534	\$4,040,194,703
2022	27	46.69%	9.93%	36.76%	5,459,960,230	1,161,439,431	4,298,520,799
2023	28	46.23%	9.56%	36.67%	5,583,877,296	1,154,481,079	4,429,396,216
2024	29	45.92%	9.20%	36.72%	5,718,775,037	1,146,245,784	4,572,529,253
2025	30	45.80%	8.84%	36.96%	5,878,470,765	1,134,740,968	4,743,729,797
2026	31	45.82%	8.46%	37.36%	6,059,272,961	1,118,338,268	4,940,934,693
2027	32	45.86%	8.04%	37.82%	6,246,487,367	1,094,950,826	5,151,536,541
2028	33	45.80%	7.61%	38.19%	6,418,482,985	1,066,323,320	5,352,159,665
2029	34	45.75%	7.16%	38.59%	6,599,287,734	1,032,338,227	5,566,949,507
2030	35	45.63%	6.69%	38.94%	6,773,534,913	992,982,637	5,780,552,276
2031	36	45.54%	6.21%	39.33%	6,954,224,114	948,000,342	6,006,223,772
2032	37	45.56%	5.71%	39.86%	7,156,908,851	896,429,781	6,260,479,070
2033	38	45.69%	5.20%	40.50%	7,379,268,547	839,447,005	6,539,821,541
2034	39	49.45%	4.68%	44.77%	8,206,231,858	776,382,154	7,429,849,704
2035	40	49.44%	4.16%	45.28%	8,428,876,536	708,530,102	7,720,346,435
2036	41	49.41%	3.65%	45.76%	8,653,832,607	638,923,715	8,014,908,892
2037	42	49.40%	3.14%	46.26%	8,889,154,002	564,344,865	8,324,809,137
2038	43	49.39%	2.62%	46.78%	9,128,590,288	483,472,016	8,645,118,272
2039	44	49.37%	2.09%	47.29%	9,366,823,076	395,908,380	8,970,914,696
2040	45	49.36%	1.56%	47.80%	9,603,163,179	303,417,534	9,299,745,645
2041	46	49.32%	1.06%	48.26%	9,833,364,035	211,355,353	9,622,008,682
2042	47	49.28%	0.61%	48.67%	10,066,494,999	124,076,405	9,942,418,594
2043	48	49.23%	0.22%	49.01%	10,298,491,552	45,766,526	10,252,725,026
2044	49	49.19%	-0.10%	49.29%	10,531,260,537	(21,352,107)	10,552,612,644
2045	50	49.13%	-0.32%	49.46%	10,762,859,874	(71,057,590)	10,833,917,464
2046	51	5.49%	-0.45%	5.94%	1,230,077,697	(100,987,020)	1,331,064,717

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 4 (continued)

Projections – Projection of Employer Normal Cost and Amortization Amount to 2046

Notes

- 1) Contributions to the Benefit Trust Reserve represent the sum of State and Federal Funds Contributions, as well as School District Contributions for the 2.2% formula (commencing in 1999). Starting in fiscal year 2019, School District contributions under Sec. 16-158(f) and 16-158(i-5) are included. Sec. 16-158 requires calculations of State contribution amounts.
- 2) The following employer contributions to the Benefit Trust Reserve were taken into account when determining the above schedule, but are not included in this schedule:
 - a) State ERI contributions of \$1,000,000 for fiscal year 2004 and \$1,684,000 for fiscal year 2005, which were made under a separate funding plan. (Beginning in fiscal year 2007, the cost of ERI is part of the 50-year funding plan, and included in this schedule);
 - b) For fiscal years prior to 2019, School District Contributions to the Benefit Trust Reserve under Sec. 16-133.2, 16-158(f) and 16-158(i-5), which are shown in Table 2; and
 - c) for FY 1999, additional State funding due to PA 90-0582, and \$9,695,600 in additional State Pensions Fund appropriations. No School District contributions are anticipated under Sec. 16-128(d-10).
- 3) The amortization rate in fiscal years 1995-1997 and 2006 is negative because contributions do not cover normal cost. A negative employer normal cost after 2020 means member contributions are projected to exceed the cost of benefits accruing.
- 4) Employer Rates, Contribution Amounts, and Assumed Payroll shown for fiscal years 1995 - 2020 are based on the June 30, 1993 - June 30, 2018 actuarial valuations and are certified amounts, with the following exceptions. The 2006 amount is the recertified amount and 2007 is the certified amount required per PA 94-0004. The 2011 amount is the originally certified amount, not the recertified amount per PA 96-1511. The 2015 amount is the certified amount; however, PA 98-0674 subsequently lowered state contributions and increased federal contributions. The 2018 amount is the recertified amount. The 2019 amount is based on a preliminary recertification. Items subsequent to 2019 are based on the June 30, 2018 valuation.

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

Notes (*continued*)

- 5) Modified ERO retirements are recognized commencing with the June 30, 2005 actuarial liability, while FY 2006 and FY 2007 Pipeline ERO retirements are first recognized in the June 30, 2006 and 2007 accrued liabilities. ERO was discontinued effective June 30, 2016.
- 6) For calculation purposes, Employer Rates include 15 decimal places. For ease of presentation, only 2 decimal places are shown.
- 7) Assumptions and methodology:
 - Payroll Growth based on valuation assumptions
 - Valuation Interest Rate = 8.00% prior to 1997, 8.50% for 1997-2011, 8.0% for 2012-2013 and 7.50% for 2013-2015 and 7.00% after 2015
 - Return on Investment Equals Valuation Interest Rate
 - Assets at cost value prior to 1997, market value 1997-2008 and 5-year smoothing actuarial value after 2008

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 5
Projections – Projection of Funded Ratio to 2046 by Tier
Total Tier I and Tier II

Amounts above the line are based on prior valuations and amounts below the line are based on the current valuation.

Year Ended June 30	Contributions	Benefits and Expenses	Market Value Asset Return	Actuarial Value of Assets *	Market Value of Assets	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	AVA Funded Ratio
1995	\$701,091,321	\$1,108,283,000		\$12,641,865,000	\$12,641,865,000	\$23,980,566,000	\$11,338,701,000	52.7%
1996	763,515,089	1,148,919,000	\$1,573,249,911	13,829,711,000	13,829,711,000	26,141,794,000	12,312,083,000	52.9%
1997	816,031,609	1,186,203,042	3,933,568,433	17,393,108,000	17,393,108,000	26,951,585,000	9,558,477,000	64.5%
1998	919,406,862	1,237,762,773	2,891,134,911	19,965,887,000	19,965,887,000	29,908,241,000	9,942,354,000	66.8%
1999	1,468,611,600	1,314,929,000	2,118,139,400	22,237,709,000	22,237,709,000	33,205,513,000	10,967,804,000	67.0%
2000	1,306,005,626	1,437,474,000	2,375,172,374	24,481,413,000	24,481,413,000	35,886,404,000	11,404,991,000	68.2%
2001	1,419,295,339	1,611,050,000	(974,012,339)	23,315,646,000	23,315,646,000	39,166,697,000	15,851,051,000	59.5%
2002	1,553,434,874	1,809,763,000	(693,032,874)	22,366,285,000	22,366,285,000	43,047,674,000	20,681,389,000	52.0%
2003	1,695,878,742	2,051,953,000	1,114,612,258	23,124,823,000	23,124,823,000	46,933,432,000	23,808,609,000	49.3%
2004	1,867,925,206	2,320,690,844	8,872,671,638	31,544,729,000	31,544,729,000	50,947,451,000	19,402,722,000	61.9%
2005	1,746,374,615	2,604,081,011	3,398,195,396	34,085,218,000	34,085,218,000	56,075,029,000	21,989,811,000	60.8%
2006	1,415,563,852	2,948,023,574	4,032,130,722	36,584,889,000	36,584,889,000	58,996,913,000	22,412,024,000	62.0%
2007	1,828,832,782	3,184,574,659	6,680,170,877	41,909,318,000	41,909,318,000	65,648,395,000	23,739,077,000	63.8%
2008	2,083,663,689	3,498,960,895	(2,063,297,794)	38,430,723,000	38,430,723,000	68,632,367,000	30,201,644,000	56.0%
2009	2,530,238,820	3,723,108,308	(8,706,541,270)	38,026,043,512	28,531,312,242	73,027,198,000	35,001,154,488	52.1%
2010	3,218,908,199	4,003,538,821	3,577,102,594	37,439,091,771	31,323,784,214	77,293,198,000	39,854,106,229	48.4%
2011	3,528,480,558	4,329,807,307	6,948,809,729	37,769,752,971	37,471,267,194	81,299,745,000	43,529,992,029	46.5%
2012	3,613,936,264	4,641,424,675	73,046,556	37,945,397,211	36,516,825,339	90,024,945,000	52,079,547,789	42.1%
2013	3,886,866,763	4,969,794,354	4,424,870,751	38,155,191,497	39,858,768,499	93,886,988,785	55,731,797,288	40.6%
2014	4,524,563,343	5,340,981,048	6,782,031,720	42,150,765,261	45,824,382,514	103,740,377,267	61,589,612,006	40.6%
2015	4,457,907,579	5,645,924,033	1,770,549,533	45,435,192,645	46,406,915,593	108,121,825,171	62,686,632,526	42.0%
2016	4,842,319,410	5,954,175,094	(44,103,178)	47,222,097,809	45,250,956,731	118,629,890,305	71,407,792,496	39.8%
2017	5,064,989,441	6,460,734,655	5,520,453,001	49,467,525,209	49,375,664,518	122,904,034,268	73,436,509,059	40.2%
2018	5,117,795,720	6,573,185,272	4,049,271,728	51,730,889,960	51,969,546,694	127,019,330,164	75,288,440,204	40.7%
2019	5,401,080,673	6,871,992,949	3,586,386,339	53,434,563,056	54,085,020,757	130,426,090,751	76,991,527,695	41.0%
2020	5,909,431,792	7,143,012,045	3,742,776,144	55,856,303,687	56,594,216,648	134,278,711,488	78,422,407,802	41.6%

Notes:

The projection of assets is based upon the assumption that the Employer maintains the funding policy under Public Act 94-0004 that begins with fiscal year 2006, as revised by Public Act 100-0023 effective with fiscal year 2018.

Projected amounts may not add to the dollar due to rounding.

Projected buyout amounts are excluded from both the contributions and benefit payments.

* For 2001 to 2008, assets are at fair market value; for 2009 and after, assets are 5-year smoothed value.

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 5 (continued)

**Projections – Projection of Funded Ratio to 2046 by Tier
Total Tier I and Tier II (continued)**

Year Ended June 30	Contributions	Benefits and Expenses	Market Value Asset Return	Actuarial Value of Assets *	Market Value of Assets	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	AVA Funded Ratio
2021	\$6,223,839,036	\$7,416,383,631	\$3,919,856,105	\$59,192,745,389	\$59,321,528,158	\$138,146,475,669	\$78,953,730,280	42.8%
2022	6,512,446,673	7,690,330,900	4,111,281,023	62,254,924,954	62,254,924,954	142,146,065,846	79,891,140,893	43.8%
2023	6,670,917,603	7,974,450,072	4,312,221,110	65,263,613,595	65,263,613,595	146,160,093,884	80,896,480,289	44.7%
2024	6,839,618,428	8,260,316,841	4,518,728,507	68,361,643,688	68,361,643,688	150,185,665,348	81,824,021,659	45.5%
2025	7,033,707,753	8,553,421,459	4,732,125,078	71,574,055,060	71,574,055,060	154,213,327,522	82,639,272,462	46.4%
2026	7,249,518,655	8,855,007,183	4,953,991,756	74,922,558,288	74,922,558,288	158,230,021,232	83,307,462,944	47.4%
2027	7,472,301,047	9,172,781,843	5,185,062,252	78,407,139,744	78,407,139,744	162,211,580,405	83,804,440,661	48.3%
2028	7,679,802,826	9,502,342,505	5,424,710,893	82,009,310,959	82,009,310,959	166,137,865,932	84,128,554,973	49.4%
2029	7,897,610,302	9,836,538,156	5,672,789,292	85,743,172,397	85,743,172,397	169,996,219,907	84,253,047,509	50.4%
2030	8,109,540,428	10,179,525,633	5,929,572,586	89,602,759,778	89,602,759,778	173,767,938,719	84,165,178,942	51.6%
2031	8,328,698,789	10,533,359,763	6,195,030,050	93,593,128,854	93,593,128,854	177,430,727,470	83,837,598,617	52.7%
2032	8,570,640,503	10,895,433,216	6,470,151,275	97,738,487,416	97,738,487,416	180,962,436,783	83,223,949,368	54.0%
2033	8,832,714,024	11,266,434,945	6,756,513,887	102,061,280,381	102,061,280,381	184,339,527,409	82,278,247,028	55.4%
2034	9,699,782,866	11,639,712,449	7,076,392,091	107,197,742,890	107,197,742,890	187,542,937,827	80,345,194,937	57.2%
2035	9,963,332,157	12,016,863,606	7,431,968,402	112,576,179,842	112,576,179,842	190,552,378,237	77,976,198,394	59.1%
2036	10,230,085,179	12,388,431,850	7,804,790,455	118,222,623,626	118,222,623,626	193,359,157,937	75,136,534,311	61.1%
2037	10,508,620,405	12,758,157,767	8,196,849,846	124,169,936,110	124,169,936,110	195,947,321,718	71,777,385,608	63.4%
2038	10,791,994,476	13,131,958,450	8,609,996,789	130,439,968,924	130,439,968,924	198,291,590,701	67,851,621,777	65.8%
2039	11,074,233,198	13,478,432,351	9,046,650,854	137,082,420,625	137,082,420,625	200,396,328,881	63,313,908,256	68.4%
2040	11,354,232,760	13,835,800,032	9,508,914,589	144,109,767,943	144,109,767,943	202,228,042,005	58,118,274,062	71.3%
2041	11,627,930,852	14,170,617,537	9,998,689,722	151,565,770,980	151,565,770,980	203,791,233,198	52,225,462,218	74.4%
2042	11,905,094,576	14,476,114,501	10,519,618,271	159,514,369,326	159,514,369,326	205,102,951,321	45,588,581,995	77.8%
2043	12,181,257,862	14,741,868,004	11,076,384,498	168,030,143,682	168,030,143,682	206,196,138,621	38,165,994,939	81.5%
2044	12,458,258,136	14,958,975,149	11,674,584,962	177,204,011,632	177,204,011,632	207,117,483,357	29,913,471,724	85.6%
2045	12,734,294,313	15,129,588,919	12,320,445,503	187,129,162,529	187,129,162,529	207,921,291,699	20,792,129,170	90.0%
2046	3,246,840,753	15,245,533,264	12,679,087,139	187,809,557,157	187,809,557,157	208,677,285,730	20,867,728,573	90.0%

Notes:

The projection of assets is based upon the assumption that the Employer maintains the funding policy under Public Act 94-0004 that begins with fiscal year 2006, as revised by Public Act 100-0023 effective with fiscal year 2018.

Projected amounts may not add to the dollar due to rounding.

Projected buyout amounts are excluded from both the contributions and benefit payments.

* For 2001 to 2008, assets are at fair market value; for 2009 and after, assets are 5-year smoothed value.

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 5 (continued)

**Projections – Projection of Funded Ratio to 2046 by Tier
Tier I**

Year Ended June 30	Contributions	Benefits and Expenses	Market Value Asset Return	Actuarial Value of Assets	Market Value of Assets	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	AVA Funded Ratio
2014				\$42,060,460,784	\$45,726,207,620	\$103,665,420,423	\$61,604,959,639	40.6%
2015	\$4,357,376,533	\$5,636,978,805	\$1,759,751,948	45,238,833,875	46,206,357,296	108,001,248,291	62,762,414,416	41.9%
2016	4,761,135,081	5,938,766,822	(43,878,630)	46,944,396,204	44,984,846,925	118,449,453,398	71,505,057,193	39.6%
2017	4,964,338,090	6,438,142,918	5,482,643,972	49,084,836,109	48,993,686,068	122,638,280,909	73,553,444,799	40.0%
2018	4,994,858,498	6,547,670,601	4,013,422,755	51,218,006,139	51,454,296,720	126,627,563,072	75,409,556,933	40.4%
2019	5,240,704,932	6,842,466,517	3,545,739,115	52,756,075,759	53,398,274,250	129,899,464,386	77,143,388,627	40.6%
2020	5,708,941,141	7,106,493,182	3,688,964,876	54,963,567,980	55,689,687,085	133,579,901,651	78,616,333,671	41.1%
2021	5,982,157,217	7,371,288,679	3,849,658,495	58,023,974,186	58,150,214,117	137,235,836,203	79,211,862,017	42.3%
2022	6,228,493,911	7,635,630,954	4,021,265,192	60,764,342,266	60,764,342,266	140,981,469,216	80,217,126,951	43.1%
2023	6,343,549,679	7,907,930,263	4,198,750,638	63,398,712,320	63,398,712,320	144,698,537,425	81,299,825,105	43.8%
2024	6,468,007,996	8,186,943,347	4,377,747,125	66,057,524,094	66,057,524,094	148,373,766,606	82,316,242,512	44.5%
2025	6,615,401,033	8,472,239,422	4,559,037,343	68,759,723,048	68,759,723,048	151,992,743,340	83,233,020,291	45.2%
2026	6,781,709,277	8,765,775,608	4,743,738,292	71,519,395,008	71,519,395,008	155,535,949,562	84,016,554,554	46.0%
2027	6,951,703,189	9,074,352,341	4,932,064,930	74,328,810,787	74,328,810,787	158,973,048,083	84,644,237,296	46.8%
2028	7,102,694,911	9,392,430,702	5,122,876,002	77,161,950,998	77,161,950,998	162,277,631,119	85,115,680,121	47.5%
2029	7,260,408,650	9,716,971,096	5,315,356,884	80,020,745,437	80,020,745,437	165,426,871,229	85,406,125,793	48.4%
2030	7,409,481,070	10,049,942,889	5,509,036,017	82,889,319,635	82,889,319,635	168,393,660,436	85,504,340,801	49.2%
2031	7,562,371,795	10,393,144,055	5,703,175,345	85,761,722,721	85,761,722,721	171,146,364,034	85,384,641,313	50.1%
2032	7,734,448,803	10,743,299,223	5,898,010,826	88,650,883,126	88,650,883,126	173,653,957,559	85,003,074,433	51.1%
2033	7,923,202,680	11,101,934,733	6,094,306,197	91,566,457,270	91,566,457,270	175,881,848,291	84,315,391,022	52.1%
2034	8,713,409,974	11,461,544,511	6,313,467,300	95,131,790,033	95,131,790,033	177,800,166,029	82,668,375,995	53.5%
2035	8,897,316,112	11,823,951,486	6,556,793,064	98,761,947,724	98,761,947,724	179,377,210,535	80,615,262,811	55.1%
2036	9,081,767,907	12,179,658,120	6,804,910,183	102,468,967,694	102,468,967,694	180,592,042,367	78,123,074,673	56.7%
2037	9,275,968,314	12,531,142,266	7,058,896,650	106,272,690,393	106,272,690,393	181,418,340,581	75,145,650,188	58.6%
2038	9,472,627,833	12,886,830,735	7,319,591,226	110,178,078,717	110,178,078,717	181,815,171,111	71,637,092,394	60.6%
2039	9,665,811,750	13,211,944,059	7,588,350,879	114,220,297,287	114,220,297,287	181,774,675,251	67,554,377,964	62.8%
2040	9,856,711,011	13,547,602,081	7,866,239,623	118,395,645,840	118,395,645,840	181,248,222,056	62,852,576,216	65.3%
2041	10,041,732,981	13,859,210,707	8,154,083,488	122,732,251,602	122,732,251,602	180,225,318,580	57,493,066,978	68.1%
2042	10,231,822,491	14,139,562,335	8,454,486,718	127,278,998,476	127,278,998,476	178,708,473,776	51,429,475,299	71.2%
2043	10,424,249,193	14,379,312,056	8,771,102,693	132,095,038,307	132,095,038,307	176,713,719,609	44,618,681,302	74.8%
2044	10,621,621,643	14,565,359,850	9,108,621,844	137,259,921,944	137,259,921,944	174,275,978,693	37,016,056,749	78.8%
2045	10,823,360,513	14,702,521,690	9,472,423,895	142,853,184,662	142,853,184,662	171,435,254,642	28,582,069,980	83.3%
2046	1,268,851,693	14,781,725,187	9,526,772,354	138,867,083,522	138,867,083,522	168,247,859,407	29,380,775,885	82.5%

Notes:

The projection of assets is based upon the assumption that the Employer maintains the funding policy under Public Act 94-0004 that begins with fiscal year 2006, as revised by Public Act 100-0023 effective with fiscal year 2018.

Projected amounts may not add to the dollar due to rounding.

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 5 (continued)

**Projections – Projection of Funded Ratio to 2046 by Tier
Tier II**

Year Ended June 30	Contributions	Benefits and Expenses	Market Value Asset Return	Actuarial Value of Assets	Market Value of Assets	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	AVA Funded Ratio
2014				\$90,304,477	\$98,174,894	\$74,956,844	(\$15,347,633)	120.5%
2015	\$100,531,046	\$8,945,228	\$10,797,585	196,358,770	200,558,297	120,576,880	(75,781,890)	162.8%
2016	81,184,329	15,408,272	(224,548)	277,701,605	266,109,806	180,436,907	(97,264,698)	153.9%
2017	100,651,351	22,591,737	37,809,030	382,689,100	381,978,450	265,753,359	(116,935,740)	144.0%
2018	122,937,222	25,514,671	35,848,973	512,883,821	515,249,974	391,767,092	(121,116,729)	130.9%
2019	160,375,741	29,526,432	40,647,224	678,487,297	686,746,507	526,626,364	(151,860,933)	128.8%
2020	200,490,651	36,518,862	53,811,268	892,735,707	904,529,564	698,809,837	(193,925,870)	127.8%
2021	241,681,819	45,094,952	70,197,610	1,168,771,202	1,171,314,041	910,639,466	(258,131,736)	128.3%
2022	283,952,762	54,699,946	90,015,831	1,490,582,688	1,490,582,688	1,164,596,630	(325,986,058)	128.0%
2023	327,367,924	66,519,809	113,470,472	1,864,901,275	1,864,901,275	1,461,556,459	(403,344,816)	127.6%
2024	371,610,431	73,373,494	140,981,382	2,304,119,594	2,304,119,594	1,811,898,742	(492,220,852)	127.2%
2025	418,306,719	81,182,037	173,087,735	2,814,332,012	2,814,332,012	2,220,584,183	(593,747,829)	126.7%
2026	467,809,378	89,231,574	210,253,464	3,403,163,280	3,403,163,280	2,694,071,670	(709,091,610)	126.3%
2027	520,597,858	98,429,502	252,997,322	4,078,328,958	4,078,328,958	3,238,532,322	(839,796,635)	125.9%
2028	577,107,915	109,911,802	301,834,891	4,847,359,961	4,847,359,961	3,860,234,813	(987,125,148)	125.6%
2029	637,201,652	119,567,060	357,432,408	5,722,426,961	5,722,426,961	4,569,348,677	(1,153,078,283)	125.2%
2030	700,059,358	129,582,744	420,536,569	6,713,440,143	6,713,440,143	5,374,278,284	(1,339,161,859)	124.9%
2031	766,326,993	140,215,708	491,854,705	7,831,406,133	7,831,406,133	6,284,363,436	(1,547,042,697)	124.6%
2032	836,191,700	152,133,992	572,140,449	9,087,604,290	9,087,604,290	7,308,479,225	(1,779,125,065)	124.3%
2033	909,511,344	164,500,212	662,207,690	10,494,823,112	10,494,823,112	8,457,679,117	(2,037,143,994)	124.1%
2034	986,372,892	178,167,938	762,924,791	12,065,952,856	12,065,952,856	9,742,771,798	(2,323,181,058)	123.8%
2035	1,066,016,045	192,912,120	875,175,337	13,814,232,119	13,814,232,119	11,175,167,702	(2,639,064,417)	123.6%
2036	1,148,317,271	208,773,730	999,880,272	15,753,655,932	15,753,655,932	12,767,115,570	(2,986,540,362)	123.4%
2037	1,232,652,091	227,015,501	1,137,953,196	17,897,245,717	17,897,245,717	14,528,981,137	(3,368,264,580)	123.2%
2038	1,319,366,643	245,127,715	1,290,405,563	20,261,890,208	20,261,890,208	16,476,419,590	(3,785,470,617)	123.0%
2039	1,408,421,448	266,488,292	1,458,299,975	22,862,123,338	22,862,123,338	18,621,653,630	(4,240,469,708)	122.8%
2040	1,497,521,749	288,197,951	1,642,674,967	25,714,122,103	25,714,122,103	20,979,819,949	(4,734,302,153)	122.6%
2041	1,586,197,871	311,406,830	1,844,606,234	28,833,519,377	28,833,519,377	23,565,914,618	(5,267,604,760)	122.4%
2042	1,673,272,085	336,552,166	2,065,131,554	32,235,370,850	32,235,370,850	26,394,477,546	(5,840,893,304)	122.1%
2043	1,757,008,669	362,555,948	2,305,281,805	35,935,105,375	35,935,105,375	29,482,419,012	(6,452,686,363)	121.9%
2044	1,836,636,493	393,615,299	2,565,963,118	39,944,089,688	39,944,089,688	32,841,504,663	(7,102,585,025)	121.6%
2045	1,910,933,800	427,067,230	2,848,021,608	44,275,977,867	44,275,977,867	36,486,037,057	(7,789,940,810)	121.4%
2046	1,977,989,060	463,808,076	3,152,314,785	48,942,473,635	48,942,473,635	40,429,426,323	(8,513,047,312)	121.1%

Notes:

The projection of assets is based upon the assumption that the Employer maintains the funding policy under Public Act 94-0004 that begins with fiscal year 2006, as revised by Public Act 100-0023 effective with fiscal year 2018.

Projected amounts may not add to the dollar due to rounding.

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 6

Projections – Projection of Actuarial Accrued Liability to 2046 by Member Group

Year Ended June 30	Tier I Current Active	Tier II Current Active	New Entrants	Inactive	Total Actuarial Accrued Liability
2018	\$40,497,723,225	\$391,767,092	-	\$86,129,839,847	\$127,019,330,164
2019	45,077,350,704	493,930,267	\$32,696,097	84,822,113,682	130,426,090,751
2020	49,804,446,000	601,757,632	97,052,205	83,775,455,651	134,278,711,488
2021	54,681,372,453	718,362,615	192,276,851	82,554,463,750	138,146,475,669
2022	59,709,682,839	847,093,719	317,502,911	81,271,786,377	142,146,065,846
2023	64,881,364,556	989,751,111	471,805,348	79,817,172,869	146,160,093,884
2024	70,182,446,942	1,146,734,037	665,164,705	78,191,319,664	150,185,665,348
2025	75,596,874,511	1,319,502,723	901,081,460	76,395,868,829	154,213,327,522
2026	81,102,685,653	1,510,200,428	1,183,871,242	74,433,263,909	158,230,021,232
2027	86,666,821,364	1,720,050,301	1,518,482,022	72,306,226,719	162,211,580,405
2028	92,256,987,731	1,949,449,146	1,910,785,667	70,020,643,388	166,137,865,932
2029	97,844,045,900	2,199,414,843	2,369,933,834	67,582,825,329	169,996,219,907
2030	103,393,347,733	2,471,308,422	2,902,969,862	65,000,312,702	173,767,938,719
2031	108,862,564,312	2,766,568,495	3,517,794,941	62,283,799,722	177,430,727,470
2032	114,208,170,059	3,086,479,602	4,221,999,622	59,445,787,500	180,962,436,783
2033	119,382,614,798	3,432,207,945	5,025,471,172	56,499,233,493	184,339,527,409
2034	124,337,393,381	3,805,058,991	5,937,712,808	53,462,772,648	187,542,937,827
2035	129,024,923,151	4,206,057,363	6,969,110,339	50,352,287,384	190,552,378,237
2036	133,403,618,357	4,636,376,402	8,130,739,168	47,188,424,011	193,359,157,937
2037	137,427,338,874	5,096,801,529	9,432,179,608	43,991,001,707	195,947,321,718
2038	141,036,200,469	5,588,211,852	10,888,207,738	40,778,970,642	198,291,590,701
2039	144,182,770,632	6,111,669,276	12,509,984,353	37,591,904,619	200,396,328,881
2040	146,819,909,471	6,668,137,372	14,311,682,577	34,428,312,585	202,228,042,005
2041	148,917,251,855	7,257,928,279	16,307,986,338	31,308,066,725	203,791,233,198
2042	150,460,111,021	7,882,191,360	18,512,286,185	28,248,362,754	205,102,951,321
2043	151,447,576,890	8,540,360,826	20,942,058,186	25,266,142,719	206,196,138,621
2044	151,902,798,007	9,231,669,636	23,609,835,028	22,373,180,686	207,117,483,357
2045	151,860,824,724	9,952,772,911	26,533,264,146	19,574,429,918	207,921,291,699
2046	151,370,786,426	10,699,591,302	29,729,835,021	16,877,072,981	208,677,285,730

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 7
Projections – Projection of Total Normal Cost to 2046 by Member Group

Year Ended June 30	Tier I Current Active	Tier II Current Active	New Entrants	Total Normal Cost
2018	\$1,955,599,219	\$96,902,494	-	\$2,052,501,712
2019	1,966,717,353	95,952,260	\$32,901,582	2,095,571,195
2020	1,962,709,338	96,079,299	65,504,586	2,124,293,224
2021	1,958,196,420	97,682,354	97,972,151	2,153,850,925
2022	1,952,706,512	100,341,395	130,097,958	2,183,145,865
2023	1,944,328,707	103,550,272	161,851,870	2,209,730,849
2024	1,931,812,681	107,022,618	195,474,765	2,234,310,064
2025	1,914,532,373	110,737,196	230,923,434	2,256,193,003
2026	1,890,495,012	114,740,301	268,539,865	2,273,775,178
2027	1,857,380,837	118,849,501	308,685,197	2,284,915,535
2028	1,815,530,546	123,373,951	351,851,315	2,290,755,811
2029	1,767,102,704	128,276,113	397,312,482	2,292,691,299
2030	1,711,473,968	133,454,106	444,988,543	2,289,916,617
2031	1,647,917,013	138,896,212	495,465,224	2,282,278,449
2032	1,575,890,422	144,538,048	548,388,323	2,268,816,793
2033	1,495,576,952	150,327,833	604,481,626	2,250,386,411
2034	1,406,376,713	156,303,237	663,574,253	2,226,254,203
2035	1,310,332,880	162,401,397	725,376,229	2,198,110,505
2036	1,210,485,933	168,640,913	789,951,870	2,169,078,716
2037	1,105,495,261	174,840,641	856,114,005	2,136,449,907
2038	991,474,825	181,001,681	925,753,375	2,098,229,881
2039	868,388,496	187,163,388	997,833,340	2,053,385,224
2040	738,441,690	193,256,816	1,071,578,508	2,003,277,014
2041	607,164,877	199,147,113	1,147,128,000	1,953,439,990
2042	480,574,370	204,875,936	1,223,455,757	1,908,906,063
2043	362,186,292	210,206,828	1,301,078,138	1,873,471,259
2044	256,052,278	214,874,037	1,378,364,055	1,849,290,369
2045	169,504,096	218,523,663	1,454,694,410	1,842,722,168
2046	106,449,145	220,748,196	1,529,598,378	1,856,795,718

Note:
 The normal cost in this table does not include administrative expenses.

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 8

Projections – Projection of Benefit Payments to 2046 by Member Group

Year Ended June 30	Tier I Current Active	Tier II Current Active	New Entrants	Inactives	Total Benefit Payments	Administrative Expenses	Total Benefits and Expenses
2018	\$124,448,477	\$22,690,255	-	\$6,413,765,333	\$6,560,904,065	\$21,550,896	\$6,582,454,961
2019	278,683,913	23,630,478	\$1,273,525	6,540,908,695	6,844,496,611	27,496,337	6,871,992,948
2020	441,932,758	25,194,311	5,461,194	6,641,590,730	7,114,178,993	28,833,052	7,143,012,045
2021	612,367,526	25,607,414	12,419,543	6,736,195,739	7,386,590,222	29,793,408	7,416,383,631
2022	790,459,663	24,433,682	21,962,054	6,822,695,492	7,659,550,891	30,780,009	7,690,330,900
2023	983,647,377	22,889,991	34,055,930	6,902,066,237	7,942,659,535	31,790,538	7,974,450,073
2024	1,195,896,437	22,165,597	40,340,135	6,969,135,562	8,227,537,731	32,779,110	8,260,316,841
2025	1,427,650,947	21,241,187	47,707,453	7,023,036,919	8,519,636,506	33,784,953	8,553,421,459
2026	1,681,540,936	19,601,829	55,948,641	7,063,106,993	8,820,198,399	34,808,784	8,855,007,182
2027	1,964,486,089	18,099,250	65,105,347	7,089,242,185	9,136,932,871	35,848,971	9,172,781,842
2028	2,273,851,620	17,923,374	75,110,884	7,098,569,277	9,465,455,155	36,887,350	9,502,342,505
2029	2,606,561,133	18,463,474	82,468,598	7,091,075,455	9,798,568,660	37,969,496	9,836,538,156
2030	2,965,344,231	19,355,079	89,754,401	7,066,000,387	10,140,454,098	39,071,535	10,179,525,633
2031	3,354,552,114	20,603,577	97,200,867	7,020,806,637	10,493,163,195	40,196,568	10,533,359,763
2032	3,771,937,351	22,390,817	105,288,715	6,954,471,694	10,854,088,577	41,344,640	10,895,433,216
2033	4,218,627,230	24,866,292	113,035,224	6,867,400,126	11,223,928,872	42,506,072	11,266,434,944
2034	4,691,729,274	28,011,946	121,309,477	6,754,982,792	11,596,033,489	43,678,960	11,639,712,449
2035	5,189,112,483	32,124,626	129,611,812	6,621,139,468	11,971,988,389	44,875,217	12,016,863,606
2036	5,704,801,599	37,148,524	138,042,621	6,462,341,536	12,342,334,280	46,097,570	12,388,431,850
2037	6,239,045,339	43,356,858	147,609,683	6,280,784,527	12,710,796,407	47,361,361	12,758,157,767
2038	6,798,120,856	50,713,328	155,829,456	6,078,648,486	13,083,312,126	48,646,323	13,131,958,449
2039	7,365,911,265	59,140,087	166,158,863	5,837,288,858	13,428,499,073	49,933,278	13,478,432,351
2040	7,941,128,748	68,735,095	175,667,772	5,599,058,316	13,784,589,931	51,210,101	13,835,800,032
2041	8,509,901,740	80,058,228	184,960,181	5,343,215,209	14,118,135,358	52,482,179	14,170,617,537
2042	9,061,037,817	92,363,291	195,253,965	5,073,689,510	14,422,344,583	53,769,919	14,476,114,502
2043	9,583,744,966	107,148,987	204,023,171	4,791,889,304	14,686,806,428	55,061,577	14,741,868,005
2044	10,058,763,590	124,306,045	215,596,745	4,503,953,646	14,902,620,026	56,355,123	14,958,975,149
2045	10,483,483,345	145,919,760	225,262,133	4,217,269,002	15,071,934,240	57,654,680	15,129,588,920
2046	10,850,574,785	172,066,496	233,895,210	3,930,016,455	15,186,552,946	58,980,317	15,245,533,264

Note: The projected benefit payments shown above do not include projected buyout amounts of \$547,801,405, \$106,434,380, and \$109,479,427 for the years ending June 30, 2019, 2020, and 2021, respectively.

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 9
Projections – Projection of Payroll to 2046 by Member Group

Year Ended June 30	Tier I Current Active	Tier II Current Active	New Entrants	Total Payroll
2018	\$8,917,168,708	\$1,344,929,361	-	\$10,262,098,069
2019	8,817,922,814	1,336,898,153	\$445,054,527	10,599,875,494
2020	8,726,909,674	1,333,831,237	893,842,660	10,954,583,571
2021	8,634,099,783	1,337,720,278	1,347,633,263	11,319,453,324
2022	8,539,263,116	1,351,362,717	1,803,667,970	11,694,293,803
2023	8,440,804,257	1,375,473,165	2,261,948,216	12,078,225,638
2024	8,324,810,659	1,403,851,963	2,725,152,829	12,453,815,451
2025	8,188,114,091	1,432,680,619	3,215,171,817	12,835,966,527
2026	8,027,070,174	1,461,743,368	3,736,138,613	13,224,952,155
2027	7,835,731,351	1,491,845,709	4,292,574,935	13,620,151,995
2028	7,602,354,741	1,521,269,210	4,891,040,954	14,014,664,905
2029	7,345,787,958	1,551,442,294	5,528,576,059	14,425,806,311
2030	7,066,068,411	1,582,130,963	6,196,306,346	14,844,505,720
2031	6,757,196,462	1,611,540,753	6,903,203,616	15,271,940,831
2032	6,417,110,570	1,639,777,922	7,651,240,968	15,708,129,460
2033	6,043,712,591	1,665,764,705	8,439,916,893	16,149,394,189
2034	5,635,312,403	1,689,039,253	9,270,659,547	16,595,011,203
2035	5,204,884,169	1,709,242,503	10,135,380,222	17,049,506,894
2036	4,754,836,666	1,725,919,216	11,033,161,578	17,513,917,460
2037	4,297,936,801	1,739,659,314	11,956,475,027	17,994,071,142
2038	3,822,639,390	1,750,954,653	12,908,674,713	18,482,268,756
2039	3,322,096,383	1,758,522,855	13,890,604,340	18,971,223,578
2040	2,817,198,128	1,761,475,427	14,877,655,122	19,456,328,677
2041	2,315,210,503	1,757,961,700	15,866,459,091	19,939,631,294
2042	1,836,972,132	1,748,392,984	16,843,519,070	20,428,884,186
2043	1,397,307,120	1,734,942,486	17,787,376,055	20,919,625,661
2044	1,004,012,294	1,715,630,328	18,691,441,819	21,411,084,441
2045	672,229,316	1,689,904,138	19,542,693,640	21,904,827,094
2046	430,822,183	1,654,825,795	20,322,830,423	22,408,478,401

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 10
Projections – Projection of Member Count to 2046 by Member Group

Year Ended June 30	Tier I			Tier II			Total		
	Number Active	Number Retired and Inactive	Sub-Total	Number Active	Number Retired and Inactive	Sub-Total	Number Active	Number Retired and Inactive	Grand Total
2018	116,583	235,706	352,289	43,842	15,970	59,812	160,425	251,676	412,101
2019	110,073	233,074	343,147	50,352	15,188	65,540	160,425	248,262	408,687
2020	104,084	230,241	334,325	56,341	14,411	70,752	160,425	244,652	405,077
2021	98,562	227,215	325,777	61,863	13,648	75,511	160,425	240,863	401,288
2022	93,447	223,987	317,434	66,978	12,906	79,884	160,425	236,892	397,317
2023	88,631	220,727	309,358	71,794	12,253	84,047	160,425	232,980	393,405
2024	83,966	217,208	301,174	76,459	11,701	88,160	160,425	228,910	389,335
2025	79,352	213,521	292,873	81,073	11,227	92,300	160,425	224,748	385,173
2026	74,728	209,715	284,443	85,697	10,849	96,546	160,425	220,564	380,989
2027	70,034	205,847	275,881	90,391	10,564	100,955	160,425	216,411	376,836
2028	65,380	201,804	267,184	95,045	10,504	105,549	160,425	212,308	372,733
2029	60,800	197,544	258,344	99,625	10,509	110,134	160,425	208,053	368,478
2030	56,236	193,126	249,362	104,189	10,631	114,820	160,425	203,757	364,182
2031	51,680	188,560	240,240	108,745	10,850	119,595	160,425	199,410	359,835
2032	47,137	183,848	230,985	113,288	11,193	124,481	160,425	195,040	355,465
2033	42,608	178,996	221,604	117,817	11,631	129,448	160,425	190,627	351,052
2034	38,167	173,938	212,105	122,258	12,176	134,434	160,425	186,115	346,540
2035	33,832	168,666	202,498	126,593	12,809	139,402	160,425	181,475	341,900
2036	29,672	163,121	192,793	130,753	13,521	144,274	160,425	176,642	337,067
2037	25,601	157,400	183,001	134,824	14,361	149,185	160,425	171,761	332,186
2038	21,605	151,532	173,137	138,820	15,265	154,085	160,425	166,797	327,222
2039	17,808	150,599	168,407	142,617	17,121	159,738	160,425	167,720	328,145
2040	14,246	149,392	163,638	146,179	19,079	165,258	160,425	168,471	328,896
2041	11,017	147,830	158,847	149,408	21,129	170,537	160,425	168,959	329,384
2042	8,173	145,882	154,055	152,252	23,279	175,531	160,425	169,161	329,586
2043	5,733	143,548	149,281	154,692	25,508	180,200	160,425	169,056	329,481
2044	3,751	140,792	144,543	156,674	27,915	184,589	160,425	168,707	329,132
2045	2,349	137,505	139,854	158,076	30,456	188,532	160,425	167,961	328,386
2046	1,419	133,809	135,228	159,006	33,117	192,123	160,425	166,926	327,351

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 11
Projections – Projection of Employer Normal Cost to 2046 by Member Group

Year Ended June 30	Payroll			Employer Normal Cost (\$)				Employer Normal Cost (% of Pay)				
	Tier I	Tier II	Total	Tier I	Tier II	Administrative Expenses		Total	Tier I (% of pay)	Tier II (% of pay)	Admin. Expenses	
						Tier I	Tier II				Total	Total
2020	\$8,726,909,674	\$2,227,673,897	\$10,954,583,571	\$1,177,287,468	(\$38,906,765)	\$28,833,052	\$1,167,213,754	13.49%	-1.75%	0.26%	10.66%	
2021	8,634,099,783	2,685,353,541	11,319,453,324	1,181,127,439	(46,027,314)	29,793,408	1,164,893,534	13.68%	-1.71%	0.26%	10.29%	
2022	8,539,263,116	3,155,030,687	11,694,293,803	1,184,172,831	(53,513,409)	30,780,009	1,161,439,431	13.87%	-1.70%	0.26%	9.93%	
2023	8,440,804,257	3,637,421,381	12,078,225,638	1,184,656,324	(61,965,783)	31,790,538	1,154,481,079	14.03%	-1.70%	0.26%	9.56%	
2024	8,324,810,659	4,129,004,792	12,453,815,451	1,182,579,722	(69,113,048)	32,779,110	1,146,245,784	14.21%	-1.67%	0.26%	9.20%	
2025	8,188,114,091	4,647,852,436	12,835,966,527	1,177,602,104	(76,646,089)	33,784,953	1,134,740,968	14.38%	-1.65%	0.26%	8.84%	
2026	8,027,070,174	5,197,881,981	13,224,952,155	1,168,058,696	(84,529,212)	34,808,784	1,118,338,268	14.55%	-1.63%	0.26%	8.46%	
2027	7,835,731,351	5,784,420,644	13,620,151,995	1,152,165,015	(93,063,160)	35,848,971	1,094,950,826	14.70%	-1.61%	0.26%	8.04%	
2028	7,602,354,741	6,412,310,164	14,014,664,905	1,131,318,619	(101,882,649)	36,887,350	1,066,323,320	14.88%	-1.59%	0.26%	7.61%	
2029	7,345,787,958	7,080,018,353	14,425,806,311	1,105,981,788	(111,613,057)	37,969,496	1,032,338,227	15.06%	-1.58%	0.26%	7.16%	
2030	7,066,068,411	7,778,437,309	14,844,505,720	1,075,527,811	(121,616,709)	39,071,535	992,982,637	15.22%	-1.56%	0.26%	6.69%	
2031	6,757,196,462	8,514,744,369	15,271,940,831	1,039,769,332	(131,965,557)	40,196,568	948,000,342	15.39%	-1.55%	0.26%	6.21%	
2032	6,417,110,570	9,291,018,890	15,708,129,460	998,350,471	(143,265,329)	41,344,640	896,429,781	15.56%	-1.54%	0.26%	5.71%	
2033	6,043,712,591	10,105,681,598	16,149,394,189	951,642,819	(154,701,885)	42,506,072	839,447,005	15.75%	-1.53%	0.26%	5.20%	
2034	5,635,312,403	10,959,698,800	16,595,011,203	899,198,597	(166,495,402)	43,678,960	776,382,154	15.96%	-1.52%	0.26%	4.68%	
2035	5,204,884,169	11,844,622,725	17,049,506,894	841,893,305	(178,238,420)	44,875,217	708,530,102	16.18%	-1.50%	0.26%	4.16%	
2036	4,754,836,666	12,759,080,794	17,513,917,460	782,550,633	(189,724,488)	46,097,570	638,923,715	16.46%	-1.49%	0.26%	3.65%	
2037	4,297,936,801	13,696,134,341	17,994,071,142	718,680,949	(201,697,444)	47,361,361	564,344,865	16.72%	-1.47%	0.26%	3.14%	
2038	3,822,639,390	14,659,629,366	18,482,268,756	647,437,280	(212,611,587)	48,646,323	483,472,016	16.94%	-1.45%	0.26%	2.62%	
2039	3,322,096,383	15,649,127,195	18,971,223,578	569,399,821	(223,424,719)	49,933,278	395,908,380	17.14%	-1.43%	0.26%	2.09%	
2040	2,817,198,128	16,639,130,549	19,456,328,677	484,893,859	(232,686,425)	51,210,101	303,417,534	17.21%	-1.40%	0.26%	1.56%	
2041	2,315,210,503	17,624,420,791	19,939,631,294	398,795,931	(239,922,758)	52,482,179	211,355,353	17.23%	-1.36%	0.26%	1.06%	
2042	1,836,972,132	18,591,912,054	20,428,884,186	315,246,878	(244,940,392)	53,769,919	124,076,405	17.16%	-1.32%	0.26%	0.61%	
2043	1,397,307,120	19,522,318,541	20,919,625,661	236,428,651	(245,723,702)	55,061,577	45,766,526	16.92%	-1.26%	0.26%	0.22%	
2044	1,004,012,294	20,407,072,147	21,411,084,441	165,691,171	(243,398,402)	56,355,123	(21,352,107)	16.50%	-1.19%	0.26%	-0.10%	
2045	672,229,316	21,232,597,778	21,904,827,094	109,003,457	(237,715,727)	57,654,680	(71,057,590)	16.22%	-1.12%	0.26%	-0.32%	
2046	430,822,183	21,977,656,218	22,408,478,401	67,675,148	(227,642,486)	58,980,317	(100,987,020)	15.71%	-1.04%	0.26%	-0.45%	

SECTION 5: Projections for the Teachers' Retirement System of the State of Illinois

TABLE 12
Projections – Projection of Debt Service to 2033

Fiscal Year	Debt Service
2018	\$363,801,653
2019	374,735,158
2020	399,198,690
2021	422,197,518
2022	443,731,640
2023	463,801,058
2024	497,200,770
2025	528,003,960
2026	541,748,515
2027	553,983,980
2028	579,505,355
2029	602,763,095
2030	638,552,200
2031	671,323,125
2032	686,280,870
2033	684,179,980

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT 1

GASB 25 Schedule of Employer Contributions (\$ in thousands)

Fiscal Year ended June 30	Actuarially Determined Contribution (ADC)*	Percentage Contributed
2009	\$2,109,480	75.9%
2010	2,481,914	90.6%
2011	2,743,221	84.7%
2012	3,429,945	74.6%
2013	3,582,033	79.8%
2014	4,091,978	87.8%
2015	4,119,526	85.5%
2016	4,582,530	84.9%
2017	6,248,879	66.2%
2018	7,080,756	59.0%

**Prior to 2017, the ADC is the same as the GASB ARC determined under GASB 25. Beginning in FY 2017, the ADC is based on the Board's funding policy.*

The information presented above was determined as part of the actuarial valuation as of two years prior to the dates indicated (e.g., the contribution determined by the valuation completed as of June 30, 2016, was contributed in the fiscal year ended June 30, 2018).

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT 1 (continued)

GASB 25 Schedule of Employer Contributions (\$ in thousands)

Fiscal Year	Actuarially Determined Contributions	State Contributions	Federal and Employer Contributions	Total Non-Member Contributions	Contribution Deficiency	Covered Payroll	Total Non-Member Contributions as a Percentage of Covered Payroll
2009	\$2,109,480	\$1,449,889	\$151,716	\$1,601,605	\$507,875	\$8,945,021	17.9%
2010	2,481,914	2,079,129	170,653	2,249,782	232,132	9,251,139	24.3%
2011	2,743,221	2,169,518	154,150	2,323,668	419,553	9,205,603	25.2%
2012	3,429,945	2,405,172	153,409	2,558,581	871,364	9,321,098	27.4%
2013	3,582,033	2,702,278	155,787	2,858,065	723,968	9,394,741	30.4%
2014	4,091,978	3,437,478	157,228	3,594,706	497,272	9,512,810	37.8%
2015	4,119,526	3,376,878	144,780	3,521,658	597,868	9,641,171	36.5%
2016	4,582,530	3,741,802	147,408	3,889,210	693,320	9,811,614	39.6%
2017	6,248,879	3,985,783	148,749	4,134,532	2,114,347	9,965,570	41.5%
2018	7,080,756	4,094,616	84,034	4,178,650	2,902,106	10,163,980	41.1%

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

**EXHIBIT 2
GASB 25 Schedule of Funding Progress (\$ in thousands)**

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Valuation Date	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AAL)	Unfunded Actuarial Accrued Liability (UAAL) (3) – (2)	Funded Ratio (2) / (3)	Covered Payroll	UAAL as a % of Payroll (4) / (6)
6/30/2009	\$38,026,044	\$73,027,198	\$35,001,154	52.1%	\$8,945,021	391.3%
6/30/2010	37,439,092	77,293,198	39,854,106	48.4%	9,251,139	430.8%
6/30/2011	37,769,753	81,299,745	43,529,992	46.5%	9,205,603	472.9%
6/30/2012	37,945,397	90,024,945	52,079,548	42.1%	9,321,098	558.7%
6/30/2013	38,155,191	93,886,989	55,731,798	40.6%	9,394,741	593.2%
6/30/2014	42,150,765	103,740,377	61,589,612	40.6%	9,512,810	647.4%
6/30/2015	45,435,193	108,121,825	62,686,632	42.0%	9,641,171	650.2%
6/30/2016	47,222,098	118,629,890	71,407,792	39.8%	9,811,614	727.8%
6/30/2017	49,467,525	122,904,034	73,436,509	40.2%	9,965,570	736.9%
6/30/2018	51,730,890	127,019,330	75,288,440	40.7%	10,163,980	740.7%

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

**EXHIBIT 3
GASB 25 Solvency Test (\$ in thousands)**

Valuation as of June 30	Actuarial Accrued Liability for:			Valuation Assets	Portion of Actuarial Accrued Liability Covered by Valuation Assets		
	(1) Active Member Contributions	(2) Retirees and Beneficiaries	(3) Active Member (Employer Financed Portion)		(1)	(2)	(3)
2009	\$7,320,600	\$44,495,917	\$21,210,681	\$38,026,044	100%	69%	0%
2010	7,715,984	47,475,906	22,101,308	37,439,092	100%	63%	0%
2011	8,048,689	50,567,880	22,683,176	37,769,753	100%	59%	0%
2012	8,270,073	58,734,636	23,020,236	37,945,397	100%	51%	0%
2013	8,569,939	61,254,334	24,062,715	38,155,191	100%	48%	0%
2014	8,890,558	65,614,627	29,235,192	42,150,765	100%	51%	0%
2015	9,281,893	70,545,782	28,294,150	45,435,193	100%	51%	0%
2016	9,629,934	77,688,075	31,311,881	47,222,098	100%	48%	0%
2017	9,683,095	80,882,353	32,338,586	49,467,525	100%	49%	0%
2018	10,057,427	82,968,465	33,993,438	51,730,890	100%	50%	0%

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT 4
GASB 67 Net Pension Liability

	June 30, 2018	June 30, 2017
The components of the net pension liability:		
Total pension liability	\$129,914,383,296	\$125,773,806,438
Plan fiduciary net position	<u>(51,969,546,694)</u>	<u>(49,375,664,518)</u>
Net pension liability	\$77,944,836,602	\$76,398,141,920
Plan fiduciary net position as a percentage of the total pension liability	40.0%	39.3%

Plan provisions. The plan provisions used in the measurement of the net pension liability are the same as those used in the actuarial valuation as of June 30, 2018.

Actuarial assumptions. The total pension liability was determined by an actuarial valuation as of June 30, 2018, using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	2.50%
Salary increases	9.50% at one year of service to 4.00% at 20 and more years of service
Investment rate of return	7.00%
Cost-of-living adjustments	Tier I: 3% compounded Tier II: 1.25% not compounded

The assumed mortality rates are based on the Society of Actuaries RP-2014 White Collar mortality tables, with adjustments for TRS experience, with generational improvement based on Scale MP-2017.

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

The actuarial assumptions used were based on the results of an experience study dated September 18, 2018.

Discount rate: The discount rate used to measure the total pension liability was 7.00% as of June 30, 2018. The projection of cash flows used to determine the discount rate assumes that member and employer contributions will be made at rates equal to those based on this June 30, 2018, Actuarial Valuation Report. For this purpose, only employer contributions that are intended to fund benefits of current plan members and their beneficiaries are included. Projected member and employer contributions for future plan members are included, to the extent that they exceed the service costs of future plan members.

Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments for current plan members as of June 30, 2018. Therefore, the long-term expected rate of return was applied to all periods of projected benefit payments to determine the total pension liability as of June 30, 2018.

Sensitivity of the net pension liability to changes in the discount rate. The following presents the net pension liability as of June 30, 2018, calculated using the discount rate of 7.00%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.00%) or 1-percentage-point higher (8.00%) than the current rate:

	1% Decrease (6.00%)	Current Discount Rate (7.00%)	1% Increase (8.00%)
Net pension liability as of June 30, 2018	\$95,591,974,194	\$77,944,836,602	\$63,733,576,730

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT 5

GASB 67 Schedules of Changes in Net Pension Liability

	2018	2017	2016
Total pension liability			
Service cost	\$1,838,002,948	\$1,877,570,053	\$1,681,242,232
Interest	8,703,519,454	8,390,352,464	8,264,257,311
Change of benefit terms	(374,603,419)	0	0
Differences between expected and actual experience	1,191,346,970	482,486,212	701,827,169
Changes of assumptions	(666,054,719)	(2,725,599,755)	7,553,894,504
Benefit payments, including refunds of employee contributions	<u>(6,551,634,376)</u>	<u>(6,438,005,920)</u>	<u>(5,931,207,177)</u>
Net change in total pension liability	\$4,140,576,858	\$1,586,803,054	\$12,270,014,039
Total pension liability – beginning	<u>125,773,806,438</u>	<u>124,187,003,384</u>	<u>111,916,989,345</u>
Total pension liability – ending (a)	<u>\$129,914,383,296</u>	<u>\$125,773,806,438</u>	<u>\$124,187,003,384</u>
Plan fiduciary net position			
Contributions – employer	\$84,633,117	\$149,495,577	\$148,040,767
Contributions – nonemployer contributing entity	4,095,125,358	3,986,363,699	3,742,469,245
Contributions – member	938,037,245	929,130,165	951,809,398
Net investment income	4,049,271,728	5,520,453,001	(44,103,178)
Benefit payments, including refunds of employee contributions	(6,551,634,376)	(6,438,005,920)	(5,931,207,177)
Administrative expense	<u>(21,550,896)</u>	<u>(22,728,735)</u>	<u>(22,967,917)</u>
Net change in plan fiduciary net position	\$2,593,882,176	\$4,124,707,787	(\$1,155,958,862)
Plan fiduciary net position – beginning	<u>49,375,664,518</u>	<u>45,250,956,731</u>	<u>46,406,915,593</u>
Plan fiduciary net position – ending (b)	<u>\$51,969,546,694</u>	<u>\$49,375,664,518</u>	<u>\$45,250,956,731</u>
Net pension liability – ending (a) – (b)	\$77,944,836,602	\$76,398,141,920	\$78,936,046,653
Plan fiduciary net position as a percentage of the total pension liability	40.0%	39.3%	36.4%
Actual covered employee payroll	\$10,163,980,000	\$9,965,569,893	\$9,811,614,284
Plan net pension liability as percentage of covered employee payroll	766.9%	766.6%	804.5%

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

Changes in the collective net pension liability from the beginning of the year to the end of the year arise from the net difference between changes in the total pension liability and plan fiduciary net position that occurred during the year. Changes in net pension liability will be recognized immediately as pension expense, or reported as deferred outflows of resources related to pensions or deferred inflows of resources related to pensions, depending on the nature of the change.

Differences between actual and expected investment-related experience are recognized over a closed five-year period. Differences between actual and expected non-investment-related experience and changes of assumptions are recognized over the average of the expected remaining service lives of all members who are provided with pensions through the pension plan (active employees and inactive employees). The amounts below that are not included in pension expense for the current year are included in deferred outflows of resources or deferred inflows of resources related to pensions.

**EXHIBIT 6
GASB 68 Reconciliation of Collective Net Pension Liability**

	Increase/(Decrease) For Fiscal Year Ending June 30, 2018		
	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) – (b)
Balances at beginning of year	\$125,773,806,438	\$49,375,664,518	\$76,398,141,920
Changes for the year			
Service cost	1,838,002,948		1,838,002,948
Interest	8,703,519,454		8,703,519,454
Differences between expected and actual experience	1,191,346,970		1,191,346,970
Contributions – employer		84,633,117	(84,633,117)
Contributions – nonemployer contributing entity		4,095,125,358	(4,095,125,358)
Contributions – member		938,037,245	(938,037,245)
Net investment income		4,049,271,728	(4,049,271,728)
Benefit payments, including refunds of employee contributions	(6,551,634,376)	(6,551,634,376)	0
Administrative expense		(21,550,896)	21,550,896
Change of assumptions	(666,054,719)	0	(666,054,719)
Change of benefit terms	<u>(374,603,419)</u>	<u>0</u>	<u>(374,603,419)</u>
Net changes	4,140,576,858	2,593,882,176	1,546,694,682
Balances at end of year	<u>\$129,914,383,296</u>	<u>\$51,969,546,694</u>	<u>\$77,944,836,602</u>

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT 7

GASB 68 Collective Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

	Year Established	Original Balance	Original Amortization Period	Amortization Amount	Outstanding Balance at June 30, 2018
Outflows					
Demographic	2014	\$39,950,212	5.12	\$7,802,776	\$936,332
Investment	2015	1,621,728,539	5.00	324,345,708	324,345,707
Assumption	2015	1,136,454,886	4.93	230,518,233	214,381,954
Demographic	2016	701,827,169	5.21	134,707,710	297,704,039
Investment	2016	3,482,927,259	5.00	696,585,452	1,393,170,903
Assumption	2016	7,553,894,504	5.21	1,449,883,782	3,204,243,158
Demographic	2017	482,486,212	5.14	93,868,913	294,748,386
Demographic	2018	1,191,346,970	5.46*	<u>218,195,416</u>	<u>973,151,554</u>
Total outflows				\$3,155,907,990	\$6,702,682,033
Inflows					
Investment	2014	\$3,823,239,747	5.00	\$764,647,947	\$0
Demographic	2015	90,079,446	4.93	18,271,693	16,992,674
Investment	2017	2,401,737,113	5.00	480,347,423	1,441,042,267
Assumption	2017	2,725,599,755	5.14	530,272,326	1,665,055,103
Investment	2018	643,913,847	5.00	128,782,769	515,131,078
Assumption	2018	666,054,719	5.46*	<u>121,988,044</u>	<u>544,066,675</u>
Total inflows				\$2,044,310,202	\$4,182,287,797

* Equal to the total expected remaining service lives of 2,294,287 years, divided by total employees that are provided with pensions through the plan of 420,070 (as shown in the table below), rounded to two decimal places.

	Expected Remaining Service	Counts	Average of the Expected Remaining Service
Actives Members	2,294,287	160,425	14.30
Inactive Members	-	139,269	-
Retirees and Beneficiaries	-	120,376	-
Total Employees	2,294,287	420,070	5.46

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT 7 (continued)

GASB 68 Collective Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

At June 30, 2018, deferred outflows of resources and deferred inflows of resources related to pensions are:

	<u>Deferred Outflows of Resources</u>	<u>Deferred Inflows of Resources</u>
Difference between expected and actual experience	\$1,566,540,311	\$16,992,674
Changes of assumptions	3,418,625,112	2,209,121,778
Net differences between projected and actual earnings on pension plan investments	-	<u>238,656,735</u>
Total	<u>\$4,985,165,423</u>	<u>\$2,464,771,187</u>

Deferred outflows of resources and deferred inflows of resources related to pensions will be recognized as follows:

Year ended June 30:	
2019	1,854,522,030
2020	1,331,850,710
2021	(616,562,018)
2022	(93,671,877)
2023	44,255,391
Thereafter	-

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT 8

GASB 68 Collective Pension Expense

	Fiscal Year Ending June 30, 2018	Fiscal Year Ending June 30, 2017
Components of pension expense		
Service cost	\$1,838,002,948	\$1,877,570,053
Interest on the total pension liability	8,703,519,454	8,390,352,464
Projected earnings on plan investments	(3,405,357,881)	(3,118,715,888)
Contributions – member	(938,037,245)	(929,130,165)
Administrative expense	21,550,896	22,728,735
Current year recognition of:		
Changes of assumptions	1,028,141,645	1,150,129,689
Difference between expected and actual experience	436,303,122	218,107,706
Difference between projected and actual earnings on pension plan investments	(352,846,979)	(224,064,213)
Change of benefit terms	(374,603,419)	-
Total pension expense	<u>\$6,956,672,541</u>	<u>\$7,386,978,381</u>

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT 9

GASB 67 Development of Blended Discount Rate

Fiscal Year	Projected Beginning		Projected Benefit Payments	Projected Administrative Expense	Projected Investment Earnings	Projected Ending Fiduciary Net Position
	Fiduciary Net Position	Projected Total Contributions				
2019	\$51,969,546,694	\$5,396,596,908	\$6,826,077,250	\$26,708,532	\$3,586,901,658	\$54,100,259,479
2020	54,100,259,479	5,874,440,402	7,094,294,823	26,747,556	3,743,387,094	56,597,044,595
2021	56,597,044,595	6,153,815,548	7,362,213,084	26,484,496	3,918,572,251	59,280,734,813
2022	59,280,734,813	6,406,942,656	7,628,124,469	26,770,418	4,105,973,109	62,138,755,691
2023	62,138,755,691	6,530,153,336	7,901,816,472	27,114,312	4,300,755,688	65,040,733,931
2024	65,040,733,931	6,663,967,578	8,174,674,772	27,511,882	4,499,013,708	68,001,528,563
2025	68,001,528,563	6,821,495,213	8,460,146,054	27,974,472	4,701,775,113	71,036,678,362
2026	71,036,678,362	6,998,453,772	8,753,043,555	28,411,111	4,910,162,454	74,163,839,921
2027	74,163,839,921	7,179,980,501	9,061,004,402	28,849,256	5,124,623,234	77,378,589,998
2028	77,378,589,998	7,343,661,123	9,379,621,837	29,283,869	5,344,217,739	80,657,563,153
2029	80,657,563,153	7,513,128,264	9,701,693,811	29,706,358	5,568,389,904	84,007,681,151
2030	84,007,681,151	7,674,167,150	10,035,116,043	30,103,104	5,796,850,861	87,413,480,014
2031	87,413,480,014	7,839,742,436	10,378,872,687	30,511,391	6,029,006,144	90,872,844,516
2032	90,872,844,516	8,025,217,925	10,730,275,692	30,901,501	6,265,340,542	94,402,225,790
2033	94,402,225,790	8,227,477,649	11,089,451,722	31,275,042	6,506,892,086	98,015,868,761
2034	98,015,868,761	9,031,334,242	11,450,431,932	31,628,577	6,775,335,394	102,340,477,888
2035	102,340,477,888	9,227,519,691	11,813,381,363	31,955,192	7,072,209,862	106,794,870,886
2036	106,794,870,886	9,423,518,199	12,169,492,414	32,256,504	7,378,402,887	111,395,043,054
2037	111,395,043,054	9,628,288,670	12,522,687,678	32,543,104	7,695,210,040	116,163,310,983
2038	116,163,310,983	9,835,232,882	12,877,770,928	32,820,701	8,023,794,213	121,111,746,449
2039	121,111,746,449	10,038,837,650	13,223,445,299	33,088,003	8,365,202,904	126,259,253,700
2040	126,259,253,700	10,236,767,533	13,556,715,488	33,332,343	8,720,782,949	131,626,756,351
2041	131,626,756,351	10,426,032,562	13,864,178,238	33,542,531	9,092,363,857	137,247,432,001
2042	137,247,432,001	10,616,163,568	14,139,652,363	33,716,856	9,482,818,042	143,173,044,393
2043	143,173,044,393	10,803,179,078	14,372,052,665	33,867,631	9,896,017,165	149,466,320,339
2044	149,466,320,339	10,991,387,228	14,555,299,570	34,012,401	10,336,715,058	156,205,110,654
2045	156,205,110,654	11,179,214,535	14,684,230,348	34,137,920	10,810,487,365	163,476,444,285
2046	163,476,444,285	1,603,941,591	14,753,755,723	34,245,424	10,981,909,016	161,274,293,746
2047	161,274,293,746	1,576,967,399	14,779,550,217	34,351,052	10,825,907,877	158,863,267,753
2048	158,863,267,753	1,573,979,113	14,766,367,878	34,457,872	10,657,489,110	156,293,910,226
2049	156,293,910,226	1,575,289,118	14,744,396,495	34,541,247	10,478,446,014	153,568,707,617
2050	153,568,707,617	1,579,374,049	14,700,901,569	34,343,974	10,289,354,031	150,702,190,154
2051	150,702,190,154	1,584,917,616	14,668,328,436	34,097,239	10,090,040,529	147,674,722,624
2052	147,674,722,624	1,590,729,541	14,652,970,148	33,802,127	9,878,869,088	144,457,548,978
2053	144,457,548,978	1,595,414,472	14,637,959,257	33,459,927	9,654,368,264	141,035,912,529
2054	141,035,912,529	1,598,498,237	14,667,609,665	33,072,125	9,413,937,453	137,347,666,429
2055	137,347,666,429	1,600,771,382	14,662,334,827	32,640,391	9,156,039,516	133,409,502,109

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT 9 (continued)

GASB 67 Development of Blended Discount Rate

Fiscal Year	Projected Beginning		Projected Benefit Payments	Projected Administrative Expense	Projected Investment Earnings	Projected Ending Fiduciary Net Position
	Fiduciary Net Position	Projected Total Contributions				
2056	\$133,409,502,109	\$1,602,897,761	\$14,637,231,913	\$32,166,570	\$8,881,337,622	\$129,224,339,010
2057	129,224,339,010	1,605,335,897	14,590,643,366	31,652,666	8,590,110,126	124,797,489,001
2058	124,797,489,001	1,608,138,463	14,508,823,613	31,100,830	8,283,211,721	120,148,914,743
2059	120,148,914,743	1,612,282,479	14,450,167,179	30,513,344	7,960,030,100	115,240,546,800
2060	115,240,546,800	1,618,995,926	14,322,639,875	29,892,606	7,621,164,497	110,128,174,742
2061	110,128,174,742	1,627,987,688	14,146,971,803	29,241,113	7,269,784,349	104,849,733,863
2062	104,849,733,863	1,638,908,601	13,933,746,195	28,561,444	6,908,162,404	99,434,497,229
2063	99,434,497,229	1,651,588,764	13,675,671,903	27,856,245	6,538,596,928	93,921,154,773
2064	93,921,154,773	1,665,930,723	13,391,526,487	27,128,209	6,163,135,495	88,331,566,295
2065	88,331,566,295	1,681,491,801	13,069,570,728	26,380,062	5,783,703,576	82,700,810,883
2066	82,700,810,883	1,697,492,708	12,705,261,301	25,614,546	5,402,888,352	77,070,316,096
2067	77,070,316,096	1,713,882,043	12,310,082,119	24,834,398	5,023,185,920	71,472,467,541
2068	71,472,467,541	1,730,563,928	11,877,596,497	24,042,342	4,647,085,106	65,948,477,737
2069	65,948,477,737	1,747,414,822	11,414,354,079	23,250,895	4,277,236,786	60,535,524,370
2070	60,535,524,370	1,764,432,577	10,921,530,997	22,463,629	3,916,202,034	55,272,164,356
2071	55,272,164,356	1,781,618,091	10,401,187,765	21,681,907	3,566,607,700	50,197,520,474
2072	50,197,520,474	1,798,972,932	9,856,663,391	20,907,031	3,231,075,521	45,349,998,505
2073	45,349,998,505	1,816,498,984	9,276,915,371	20,140,238	2,912,680,414	40,782,122,295
2074	40,782,122,295	1,834,197,812	8,668,757,477	19,382,694	2,614,860,578	36,543,040,514
2075	36,543,040,514	1,852,071,146	8,052,660,835	18,635,499	2,340,339,954	32,664,155,281
2076	32,664,155,281	1,870,120,731	7,436,294,878	17,899,678	2,091,048,286	29,171,129,742
2077	29,171,129,742	1,888,348,329	6,821,936,896	17,176,187	1,868,702,316	26,089,067,304
2078	26,089,067,304	1,906,755,721	6,205,857,577	16,465,906	1,675,189,840	23,448,689,383
2079	23,448,689,383	1,925,344,707	5,609,193,775	15,769,641	1,511,921,602	21,260,992,275
2080	21,260,992,275	1,944,117,104	5,040,173,292	15,088,127	1,379,379,408	19,529,227,367
2081	19,529,227,367	1,963,074,746	4,492,895,498	14,422,023	1,277,997,419	18,262,982,012
2082	18,262,982,012	1,982,219,490	3,971,834,461	13,771,916	1,208,290,200	17,467,885,325
2083	17,467,885,325	2,001,553,209	3,479,660,409	13,138,321	1,170,558,379	17,147,198,182
2084	17,147,198,182	2,021,077,794	3,019,683,525	12,521,683	1,164,914,413	17,300,985,181
2085	17,300,985,181	2,040,795,157	2,594,621,940	11,922,378	1,191,267,742	17,926,503,763
2086	17,926,503,763	2,060,707,231	2,206,505,145	11,340,713	1,249,355,411	19,018,720,546
2087	19,018,720,546	2,080,815,964	1,856,564,916	10,776,933	1,338,782,032	20,570,976,693
2088	20,570,976,693	2,101,123,330	1,545,034,261	10,231,218	1,459,073,393	22,575,907,937
2089	22,575,907,937	2,121,631,317	1,271,250,137	9,703,688	1,609,737,268	25,026,322,698
2090	25,026,322,698	2,142,341,937	1,033,803,651	9,194,405	1,790,319,625	27,915,986,205
2091	27,915,986,205	2,163,257,223	830,638,565	8,703,376	2,000,456,069	31,240,357,555
2092	31,240,357,555	2,184,379,225	659,268,166	8,230,557	2,239,915,846	34,997,153,904
2093	34,997,153,904	2,205,710,019	516,727,092	7,775,853	2,508,643,021	39,187,003,999

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT 9 (continued)

GASB 67 Development of Blended Discount Rate

Fiscal Year	Projected Beginning		Projected Benefit Payments	Projected Administrative Expense	Projected Investment Earnings	Projected Ending Fiduciary Net Position
	Fiduciary Net Position	Projected Total Contributions				
2094	\$39,187,003,999	\$2,227,251,697	\$399,794,156	\$7,339,123	\$2,806,794,425	\$43,813,916,842
2095	43,813,916,842	2,249,006,375	305,224,543	6,920,183	3,134,764,337	48,885,542,828
2096	48,885,542,828	2,270,976,192	229,825,587	6,518,811	3,493,200,111	54,413,374,733
2097	54,413,374,733	2,293,163,306	170,613,013	6,134,744	3,883,010,776	60,412,801,058
2098	60,412,801,058	2,315,569,899	124,799,760	5,767,690	4,305,371,160	66,903,174,667
2099	66,903,174,667	2,338,198,173	89,892,751	5,417,322	4,761,723,310	73,907,786,077
2100	73,907,786,077	2,361,050,356	63,701,840	5,083,289	5,253,774,308	81,453,825,612
2101	81,453,825,612	2,384,128,695	44,386,440	4,765,212	5,783,491,989	89,572,294,645
2102	89,572,294,645	2,407,435,464	30,379,956	4,462,692	6,353,101,374	98,297,988,834
2103	98,297,988,834	2,430,972,955	20,395,859	4,175,313	6,965,083,281	107,669,473,899
2104	107,669,473,899	2,454,743,489	13,406,420	3,902,639	7,622,173,378	117,729,081,706
2105	117,729,081,706	2,478,749,406	8,626,552	3,644,225	8,327,362,471	128,522,922,806
2106	128,522,922,806	2,502,993,074	5,426,720	3,399,611	9,083,900,432	140,100,989,981
2107	140,100,989,981	2,527,476,882	3,328,791	3,168,332	9,895,303,590	152,517,273,331
2108	152,517,273,331	2,552,203,245	1,986,743	2,949,914	10,765,363,464	165,829,903,383
2109	165,829,903,383	2,577,174,602	1,156,307	2,743,882	11,698,157,841	180,101,335,638
2110	180,101,335,638	2,602,393,419	657,568	2,549,757	12,698,065,008	195,398,586,740
2111	195,398,586,740	2,627,862,184	365,140	2,367,061	13,769,780,621	211,793,497,344
2112	211,793,497,344	2,653,583,412	196,945	2,195,318	14,918,336,504	229,363,024,996
2113	229,363,024,996	2,679,559,645	102,985	2,034,056	16,149,121,541	248,189,569,141
2114	248,189,569,141	2,705,793,449	52,668	1,882,806	17,467,904,869	268,361,331,984
2115	268,361,331,984	2,732,287,417	25,796	1,741,108	18,880,861,457	289,972,713,954
2116	289,972,713,954	2,759,044,169	12,404	1,608,507	20,394,599,791	313,124,737,004
2117	313,124,737,004	2,786,066,353	6,086	1,484,560	22,016,191,740	337,925,504,451
2118	337,925,504,451	2,813,356,640	2,827	1,368,830	23,753,204,786	364,490,694,220
2119	364,490,694,220	2,840,917,733	1,469	1,260,895	25,613,736,533	392,944,086,122
2120	392,944,086,122	2,868,752,361	535	1,160,341	27,606,451,730	423,418,129,336
2121	423,418,129,336	2,896,863,279	0	1,066,767	29,740,621,931	456,054,547,779

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT 9 (continued)

GASB 67 Development of Blended Discount Rate

Fiscal Year	Projected Beginning Fiduciary Net Position	Projected Benefit Payments	"Funded" Portion of Benefit Payments	"Unfunded" Portion of Benefit Payments	Present Value of "Funded" Benefit Payments at 7.00%	Present Value of "Unfunded" Benefit Payments at 3.87%*	Present Value of Benefit Payments at 7.00%
2019	\$51,969,546,694	\$6,826,077,250	\$6,826,077,250	\$0	\$6,599,017,954	\$0	\$6,599,017,954
2020	54,100,259,479	7,094,294,823	7,094,294,823	0	6,409,638,944	0	6,409,638,944
2021	56,597,044,595	7,362,213,084	7,362,213,084	0	6,216,542,955	0	6,216,542,955
2022	59,280,734,813	7,628,124,469	7,628,124,469	0	6,019,695,853	0	6,019,695,853
2023	62,138,755,691	7,901,816,472	7,901,816,472	0	5,827,736,929	0	5,827,736,929
2024	65,040,733,931	8,174,674,772	8,174,674,772	0	5,634,556,085	0	5,634,556,085
2025	68,001,528,563	8,460,146,054	8,460,146,054	0	5,449,834,398	0	5,449,834,398
2026	71,036,678,362	8,753,043,555	8,753,043,555	0	5,269,637,693	0	5,269,637,693
2027	74,163,839,921	9,061,004,402	9,061,004,402	0	5,098,169,038	0	5,098,169,038
2028	77,378,589,998	9,379,621,837	9,379,621,837	0	4,932,185,943	0	4,932,185,943
2029	80,657,563,153	9,701,693,811	9,701,693,811	0	4,767,798,562	0	4,767,798,562
2030	84,007,681,151	10,035,116,043	10,035,116,043	0	4,609,023,851	0	4,609,023,851
2031	87,413,480,014	10,378,872,687	10,378,872,687	0	4,455,053,909	0	4,455,053,909
2032	90,872,844,516	10,730,275,692	10,730,275,692	0	4,304,571,061	0	4,304,571,061
2033	94,402,225,790	11,089,451,722	11,089,451,722	0	4,157,624,836	0	4,157,624,836
2034	98,015,868,761	11,450,431,932	11,450,431,932	0	4,012,114,469	0	4,012,114,469
2035	102,340,477,888	11,813,381,363	11,813,381,363	0	3,868,493,686	0	3,868,493,686
2036	106,794,870,886	12,169,492,414	12,169,492,414	0	3,724,400,316	0	3,724,400,316
2037	111,395,043,054	12,522,687,678	12,522,687,678	0	3,581,769,731	0	3,581,769,731
2038	116,163,310,983	12,877,770,928	12,877,770,928	0	3,442,365,897	0	3,442,365,897
2039	121,111,746,449	13,223,445,299	13,223,445,299	0	3,303,521,826	0	3,303,521,826
2040	126,259,253,700	13,556,715,488	13,556,715,488	0	3,165,215,337	0	3,165,215,337
2041	131,626,756,351	13,864,178,238	13,864,178,238	0	3,025,235,131	0	3,025,235,131
2042	137,247,432,001	14,139,652,363	14,139,652,363	0	2,883,500,005	0	2,883,500,005
2043	143,173,044,393	14,372,052,665	14,372,052,665	0	2,739,152,719	0	2,739,152,719
2044	149,466,320,339	14,555,299,570	14,555,299,570	0	2,592,595,825	0	2,592,595,825
2045	156,205,110,654	14,684,230,348	14,684,230,348	0	2,444,449,558	0	2,444,449,558
2046	163,476,444,285	14,753,755,723	14,753,755,723	0	2,295,348,864	0	2,295,348,864
2047	161,274,293,746	14,779,550,217	14,779,550,217	0	2,148,936,356	0	2,148,936,356
2048	158,863,267,753	14,766,367,878	14,766,367,878	0	2,006,560,424	0	2,006,560,424
2049	156,293,910,226	14,744,396,495	14,744,396,495	0	1,872,499,807	0	1,872,499,807
2050	153,568,707,617	14,700,901,569	14,700,901,569	0	1,744,837,444	0	1,744,837,444
2051	150,702,190,154	14,668,328,436	14,668,328,436	0	1,627,076,044	0	1,627,076,044
2052	147,674,722,624	14,652,970,148	14,652,970,148	0	1,519,039,658	0	1,519,039,658
2053	144,457,548,978	14,637,959,257	14,637,959,257	0	1,418,208,892	0	1,418,208,892
2054	141,035,912,529	14,667,609,665	14,667,609,665	0	1,328,113,637	0	1,328,113,637
2055	137,347,666,429	14,662,334,827	14,662,334,827	0	1,240,781,322	0	1,240,781,322

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT 9 (continued)

GASB 67 Development of Blended Discount Rate

Fiscal Year	Projected Beginning Fiduciary Net Position	Projected Benefit Payments	"Funded" Portion of Benefit Payments	"Unfunded" Portion of Benefit Payments	Present Value of "Funded" Benefit Payments at 7.00%	Present Value of "Unfunded" Benefit Payments at 3.87%*	Present Value of Benefit Payments at 7.00%
2056	\$133,409,502,109	\$14,637,231,913	\$14,637,231,913	\$0	\$1,157,623,383	\$0	\$1,157,623,383
2057	129,224,339,010	14,590,643,366	14,590,643,366	0	1,078,447,484	0	1,078,447,484
2058	124,797,489,001	14,508,823,613	14,508,823,613	0	1,002,242,886	0	1,002,242,886
2059	120,148,914,743	14,450,167,179	14,450,167,179	0	932,888,792	0	932,888,792
2060	115,240,546,800	14,322,639,875	14,322,639,875	0	864,164,255	0	864,164,255
2061	110,128,174,742	14,146,971,803	14,146,971,803	0	797,724,511	0	797,724,511
2062	104,849,733,863	13,933,746,195	13,933,746,195	0	734,300,064	0	734,300,064
2063	99,434,497,229	13,675,671,903	13,675,671,903	0	673,551,125	0	673,551,125
2064	93,921,154,773	13,391,526,487	13,391,526,487	0	616,407,906	0	616,407,906
2065	88,331,566,295	13,069,570,728	13,069,570,728	0	562,232,130	0	562,232,130
2066	82,700,810,883	12,705,261,301	12,705,261,301	0	510,803,849	0	510,803,849
2067	77,070,316,096	12,310,082,119	12,310,082,119	0	462,538,335	0	462,538,335
2068	71,472,467,541	11,877,596,497	11,877,596,497	0	417,091,723	0	417,091,723
2069	65,948,477,737	11,414,354,079	11,414,354,079	0	374,602,410	0	374,602,410
2070	60,535,524,370	10,921,530,997	10,921,530,997	0	334,980,072	0	334,980,072
2071	55,272,164,356	10,401,187,765	10,401,187,765	0	298,149,859	0	298,149,859
2072	50,197,520,474	9,856,663,391	9,856,663,391	0	264,057,082	0	264,057,082
2073	45,349,998,505	9,276,915,371	9,276,915,371	0	232,267,107	0	232,267,107
2074	40,782,122,295	8,668,757,477	8,668,757,477	0	202,841,677	0	202,841,677
2075	36,543,040,514	8,052,660,835	8,052,660,835	0	176,098,626	0	176,098,626
2076	32,664,155,281	7,436,294,878	7,436,294,878	0	151,981,031	0	151,981,031
2077	29,171,129,742	6,821,936,896	6,821,936,896	0	130,303,687	0	130,303,687
2078	26,089,067,304	6,205,857,577	6,205,857,577	0	110,781,447	0	110,781,447
2079	23,448,689,383	5,609,193,775	5,609,193,775	0	93,579,753	0	93,579,753
2080	21,260,992,275	5,040,173,292	5,040,173,292	0	78,585,630	0	78,585,630
2081	19,529,227,367	4,492,895,498	4,492,895,498	0	65,469,679	0	65,469,679
2082	18,262,982,012	3,971,834,461	3,971,834,461	0	54,090,532	0	54,090,532
2083	17,467,885,325	3,479,660,409	3,479,660,409	0	44,287,708	0	44,287,708
2084	17,147,198,182	3,019,683,525	3,019,683,525	0	35,918,980	0	35,918,980
2085	17,300,985,181	2,594,621,940	2,594,621,940	0	28,843,826	0	28,843,826
2086	17,926,503,763	2,206,505,145	2,206,505,145	0	22,924,504	0	22,924,504
2087	19,018,720,546	1,856,564,916	1,856,564,916	0	18,026,913	0	18,026,913
2088	20,570,976,693	1,545,034,261	1,545,034,261	0	14,020,567	0	14,020,567
2089	22,575,907,937	1,271,250,137	1,271,250,137	0	10,781,388	0	10,781,388
2090	25,026,322,698	1,033,803,651	1,033,803,651	0	8,194,038	0	8,194,038
2091	27,915,986,205	830,638,565	830,638,565	0	6,153,018	0	6,153,018
2092	31,240,357,555	659,268,166	659,268,166	0	4,564,093	0	4,564,093
2093	34,997,153,904	516,727,092	516,727,092	0	3,343,257	0	3,343,257

* Bond Buyer's 20-Bond GO index

SECTION 6: GASB Information for the Teachers' Retirement System of the State of Illinois

EXHIBIT 9 (continued)

GASB 67 Development of Blended Discount Rate

Fiscal Year	Projected Beginning Fiduciary Net Position	Projected Benefit Payments	"Funded" Portion of Benefit Payments	"Unfunded" Portion of Benefit Payments	Present Value of "Funded" Benefit Payments at 7.00%	Present Value of "Unfunded" Benefit Payments at 3.87%*	Present Value of Benefit Payments at 7.00%
2094	\$39,187,003,999	\$399,794,156	\$399,794,156	\$0	\$2,417,471	\$0	\$2,417,471
2095	43,813,916,842	305,224,543	305,224,543	0	1,724,886	0	1,724,886
2096	48,885,542,828	229,825,587	229,825,587	0	1,213,824	0	1,213,824
2097	54,413,374,733	170,613,013	170,613,013	0	842,143	0	842,143
2098	60,412,801,058	124,799,760	124,799,760	0	575,710	0	575,710
2099	66,903,174,667	89,892,751	89,892,751	0	387,553	0	387,553
2100	73,907,786,077	63,701,840	63,701,840	0	256,669	0	256,669
2101	81,453,825,612	44,386,440	44,386,440	0	167,143	0	167,143
2102	89,572,294,645	30,379,956	30,379,956	0	106,916	0	106,916
2103	98,297,988,834	20,395,859	20,395,859	0	67,083	0	67,083
2104	107,669,473,899	13,406,420	13,406,420	0	41,210	0	41,210
2105	117,729,081,706	8,626,552	8,626,552	0	24,782	0	24,782
2106	128,522,922,806	5,426,720	5,426,720	0	14,570	0	14,570
2107	140,100,989,981	3,328,791	3,328,791	0	8,353	0	8,353
2108	152,517,273,331	1,986,743	1,986,743	0	4,659	0	4,659
2109	165,829,903,383	1,156,307	1,156,307	0	2,534	0	2,534
2110	180,101,335,638	657,568	657,568	0	1,347	0	1,347
2111	195,398,586,740	365,140	365,140	0	699	0	699
2112	211,793,497,344	196,945	196,945	0	352	0	352
2113	229,363,024,996	102,985	102,985	0	172	0	172
2114	248,189,569,141	52,668	52,668	0	82	0	82
2115	268,361,331,984	25,796	25,796	0	38	0	38
2116	289,972,713,954	12,404	12,404	0	17	0	17
2117	313,124,737,004	6,086	6,086	0	8	0	8
2118	337,925,504,451	2,827	2,827	0	3	0	3
2119	364,490,694,220	1,469	1,469	0	2	0	2
2120	392,944,086,122	535	535	0	1	0	1
2121	423,418,129,336	0	0	0	0	0	0
Total					\$148,359,717,596	\$0	\$148,359,717,597

* Bond Buyer's 20-Bond GO index

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Summary of Assumptions and Methods

Rationale for Assumptions:	<p>The information and analysis used in supporting each assumption that has a significant effect on this valuation is shown in the demographic and economic experience review dated September 18, 2018.</p> <p>All assumptions were adopted by the Board effective June 30, 2018, unless otherwise noted.</p>
Interest Rate:	<p>7.00% per annum, compounded annually and net of investment expenses. The interest rate assumption is composed of an inflation assumption of 2.50% and real return of 4.50%. (Adopted effective June 30, 2016.)</p>
Mortality Rates:	
Healthy Post-Retirement:	<p>RP-2014 White Collar Annuitant Tables projected generationally with Scale MP-2017, with female rates multiplied by 70% for ages under 78 and 110% for ages 78 to 114 and male rates multiplied by 94% for ages under 81 and 110% for ages 81 to 114. (Adopted effective June 30, 2018.)</p>
Disabled Post-Retirement:	<p>RP-2014 Disabled Retiree Tables projected generationally with Scale MP-2017, with female and male rates multiplied by 117% for ages 45 to 99. (Adopted effective June 30, 2018.)</p>
Beneficiary Post-Retirement:	<p>RP-2014 Annuitant Tables projected generationally with Scale MP-2017, with female and male rates multiplied by 96% and 116%, respectively, for ages 50 to 114. (Adopted effective June 30, 2018.)</p>
Pre-Retirement:	<p>RP-2014 White Collar Employee Tables projected generationally with Scale MP-2017, with female and male rates multiplied by 104% for all ages. (Adopted effective June 30, 2018.)</p>

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Salary Increase Rates:

The components include 2.50% inflation, plus merit and seniority increases. (Adopted effective June 30, 2018.) Salary increase rates are shown below for selected years of service.

Service	Rate
1	9.50%
2	7.50%
3	7.00%
4	6.75%
5	6.50%
10	5.50%
15	4.75%
20 and above	4.00%

For a member who works 34 years, the assumed average salary increase over their career is 4.94% per year.

Disability Rates:

Shown below for selected ages (Adopted effective June 30, 2018.)

Age	Male	Female
25	0.01%	0.03%
30	0.01%	0.04%
35	0.02%	0.06%
40	0.03%	0.07%
45	0.05%	0.10%
50	0.10%	0.18%
55	0.14%	0.20%
60	0.18%	0.27%
65	0.25%	0.30%

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Termination Rates:

Termination rates based on service, for causes other than death, disability, or retirement (Adopted effective June 30, 2018.)

Age	Under 5 Years of Service		5 or More Years of Service	
	Male	Female	Male	Female
25	7.0%	6.5%	3.0%	5.0%
30	6.5%	7.0%	3.0%	4.8%
35	8.0%	7.5%	1.5%	3.0%
40	10.0%	8.0%	1.8%	1.5%
45	11.0%	8.0%	1.3%	1.3%
50	12.0%	8.0%	1.3%	1.5%
55	11.5%	11.8%	2.0%	2.0%
60	15.0%	14.0%	3.0%	2.5%
65	30.0%	30.0%	3.0%	3.0%

Retirement Rates:

The following rates of retirement are assumed for members hired before January 1, 2011 (Adopted effective June 30, 2018.):

Age	Service				
	5 – 18	19 – 29	30 – 31	32 – 33	34+
54	0%	7%	8%	40%	45%
55	0%	7%	8%	40%	45%
56	0%	7%	8%	40%	45%
57	0%	7%	10%	40%	45%
58	0%	7%	10%	40%	40%
59	0%	30%	35%	60%	40%
60	20%	30%	40%	60%	40%
61	17%	30%	40%	50%	40%
62	15%	30%	40%	50%	40%
63	15%	30%	40%	50%	40%
64	22%	40%	45%	50%	40%
65	25%	40%	45%	50%	40%
66	25%	40%	45%	50%	40%
67	20%	40%	45%	50%	45%
68	20%	40%	40%	50%	45%
69	25%	40%	40%	50%	45%
70	100%	100%	100%	50%	30%
71	100%	100%	100%	50%	30%
72	100%	100%	100%	50%	30%
73	100%	100%	100%	50%	30%
74	100%	100%	100%	100%	30%
75	100%	100%	100%	100%	100%

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

The following rates of retirement are assumed for members hired on or after January 1, 2011:

Age	Service				
	9 – 18	19 – 30	31	32 – 33	34+
61 and younger	0%	0%	0%	0%	0%
62	13%	15%	20%	25%	25%
63	8%	10%	15%	20%	20%
64	8%	10%	15%	20%	20%
65	8%	10%	15%	20%	20%
66	20%	10%	15%	20%	20%
67	20%	40%	70%	70%	70%
68	20%	40%	40%	40%	40%
69	20%	40%	40%	40%	40%
70	100%	100%	100%	100%	100%

Percent Married:

For valuation purposes, 85% of members are assumed to be married. Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger than their spouses.

Inactive Vested Buyout:

22% of eligible inactive vested members are assumed to receive a lump sum buyout now in lieu of an annuity at retirement. This is consistent with the assumptions used by the Illinois legislation and may be revised in the future as experience emerges, which would affect the FY 2019 recertification.

Automatic Annual Increase Buyout:

25% of eligible retiring Tier 1 members are assumed to receive a lump sum buyout and a retirement annuity with automatic annual increases of 1.5% of the originally granted retirement benefit starting at the later of January 1 following age 67 and the first anniversary of retirement. This is consistent with the assumptions used by the Illinois legislation and may be revised in the future as experience emerges, which would affect the FY 2019 recertification.

Severance Pay:

20% of retirees are assumed to receive severance pay and the average severance payment will be 10.0% of other pensionable earnings in the last year of employment. Other pensionable earnings may include payment for unused vacation days, unused sick or personal leave, retirement incentives, 403(b) or 457(b) contributions, and bonuses for performance, good attendance, longevity, etc. (Adopted effective June 30, 2018.)

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Optional Service Purchases:

The liability for retirement benefits for active members who have not previously purchased optional service is increased to cover the employer cost of out-of-system service purchased in the last two years prior to retirement. The amount purchased varies by the amount of regular service at retirement. Representative amounts purchased at retirement, and other assumptions used, are as follows (Adopted effective June 30, 2018.):

Service	Maximum Service Purchased
10 years	0.107 years
20 years	0.445 years
25 years	0.752 years
30 years	0.841 years
34 or more	None

- a. Actual optional service credit for each current member is provided by TRS;
- b. No additional service purchases will be assumed for members who currently have optional service credit;
- c. Members will not purchase service if it does not improve their pension benefit; and
- d. When optional service is purchased within the last two years prior to retirement, 25% of the cost is covered by member payments and the remaining cost is the responsibility of the employer.

Sick Leave Service Credit:

The assumed unused and uncompensated sick leave service credit at retirement varies by the amount of regular service at retirement. Representative assumed amounts of unused and uncompensated sick leave service are as follows (Adopted effective June 30, 2018.):

Service	Sick Leave Service Credit
20 years	0.953 years
25 years	1.137 years
30 years	1.376 years
34 years	1.387 years
35 or more	None

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

2.2 Upgrade Assumption:

For those active members who have already made a payment to upgrade past service prior to June 30, 1998, their benefits are based on their upgrading at the valuation date. For all other active members, they are assumed to upgrade at retirement.

Tier II Pay Cap Increase:

1.25% per annum (Adopted effective June 30, 2016.)

Tier II COLA Increase:

1.25% per annum (Adopted effective June 30, 2016.)

Future Normal Costs:

Projected Normal Cost is based on an open group forecast with the number of active participants assumed to remain level. The new entrants are assumed to enter the plan with the following demographic mix, based on previous plan experience:

Full-Time and regular part-time:

Age	Male		Female	
	Salary	Proportion	Salary	Proportion
22	\$44,759	5.1%	\$44,832	26.2%
27	47,774	6.8	48,810	26.0
32	58,462	3.7	51,187	10.5
37	62,118	1.9	54,922	5.4
42	65,898	1.3	56,552	4.6
47	65,884	1.0	60,617	3.1
52	67,311	0.7	57,854	1.9
57	80,334	0.3	58,753	0.9
62	57,826	0.2	66,025	0.4

Substitutes, part-time, and hourly paid:

Age	Male		Female	
	Salary	Proportion	Salary	Proportion
22	\$25,602	6.6%	\$27,389	18.7%
27	23,211	7.5	25,538	14.5
32	23,447	3.2	23,948	6.8
37	23,409	2.1	21,424	6.9
42	20,932	2.2	19,266	9.6
47	20,768	1.4	18,881	5.8
52	18,770	1.5	18,342	4.1
57	17,255	1.1	18,264	3.0
62	18,287	1.2	18,461	1.8
67	17,393	0.7	19,592	0.7
70	19,629	0.3	16,195	0.3

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Census and Assets:	The current actuarial valuation was based on the latest membership data available, which was submitted by the System for active, inactive and retired members as of the prior valuation date. The valuation assumptions were used to project results to account for the one-year difference in the census date and the valuation date. Any change in liability due to changes in census between the collection date of the census information and the valuation date is captured in the next actuarial valuation.
Administrative Expenses:	\$27,496,337 of administrative expenses is expected to be paid for the year beginning July 1, 2018. \$28,833,052 of administrative expenses is expected to be paid for the year beginning July 1, 2019 and each year thereafter, increased by the rate at which payroll is expected to increase.
Asset Valuation Method:	The actuarial value of assets for funding and to determine the Actuarially Determined Contribution is based on the market value of assets with a five-year phase-in of actual investment return in excess of (or less than) expected investment income. Expected investment income is determined using the assumed investment return rate and the actuarial value of assets (adjusted for receipts and disbursements during the year). The actual investment return for this purpose is determined net of all investment and administrative expenses. For GASB 67 and 68, the fair market value of assets is used.
Actuarial Cost Method:	<p>Projected Unit Credit (adopted by statute June 30, 1989) is used for funding purposes. Under this method, the projected benefits of each individual included in the valuation are allocated by a consistent formula to valuation years. The actuarial present value of benefits allocated to a valuation year is called the normal cost. The actuarial present value of benefits allocated to all periods prior to a valuation year is called the accrued liability.</p> <p>Entry Age Normal is used for GASB 67 and 68 purposes and to determine the Actuarially Determined Contribution (“Board-Adopted Actuarial Funding Policy”), based upon the funding policy adopted by the Board. Under this method, a normal cost is calculated for each employee that is the level annual contribution as a percent of pay required to be made from the employee’s date of hire for as long as he/she remains active so that sufficient assets will be accumulated to provide his/her benefit. The accrued liability is the difference between the present value of all future benefits and the present value of all future normal costs.</p>

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Amortization Period and Method: For funding purposes under the Illinois Pension Code, the unfunded liability is not explicitly amortized. The employer contribution is the amount which, as a level percentage of member payroll, will result in the System being 90% funded by June 30, 2045. For the Board-Adopted Actuarial Funding Policy, the amortization of the unfunded accrued liability is a closed 20-year period effective June 30, 2015, and declines by one year in each subsequent valuation. Sources of unfunded actuarial accrued liability that emerge in subsequent valuations are amortized over 20-year closed periods. Contributions toward the unfunded actuarial accrued liability increase by 2% each year, the estimate of increase in future State revenue growth.

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Summary of Plan Provisions

Membership:

Employers of the System include:

- The Illinois public common school districts outside of Chicago,
- Certain state agencies employing certified teachers, and
- The State Board of Education, Illinois School Board Association, statewide and national teacher organizations, educational cooperatives and the retirement system.

Employees covered under the System include:

- Any educational, administrative, professional or other staff employed in the public common schools outside the City of Chicago in a position requiring certification under the teacher certification law, including substitute teachers, part-time teachers, and hourly paid teachers who are on a flexible work schedule;
- Any position requiring teacher certification in certain state agencies;
- Any regional superintendent of schools, assistant regional superintendent of schools, State Superintendent of Education; any person employed by the State Board of Education as an executive; any executive of the boards engaged in the service of public common school education in school districts covered under this system of which the State Superintendent of Education is an ex-officio member;
- Any employee of a school board association who is certificated under the teacher certification law;
- Any person employed by the retirement system who was an employee of and a member in the system on August 17, 2001 or becomes an employee of the system on or after August 17, 2001;
- Any educational, administrative, professional or other staff employed by and under the supervision and control of a regional superintendent of schools, provided such employment position requires the person to be certificated under the teacher certification law;

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

- Any educational, administrative, professional or other staff in a certificated position employed by a program serving two or more school districts in accordance with a joint agreement authorized by the School Code or by federal legislation;
- Any officer or employee of a statewide teacher organization or officer of a national teacher organization who is certified under the teacher certification law, provided the member had previously established creditable service under TRS and files an irrevocable election for TRS membership before January 5, 2012, and does not receive credit under any other article of the pension code; and
- Any educational, administrative, professional, or other staff employed in a charter school that is certificated under the teacher certification law.

Employment on a full-time basis covers only teachers whose normal employment schedule consist of working at least four clock hours daily, five days per week. Employment on a part-time basis covers teachers who are employed less than four clock hours daily or less than five days per week. A substitute teacher is employed on temporary basis to replace another teacher.

Creditable service rendered as an employee for a regular school year in any district, in accordance with the provisions of the Pension Code, is equal to one year of service, and time less than a legal year is counted as such portion of a year as the number of days taught bears to 170 days. Additionally, members may purchase various types of optional service credit.

“Tier II” means a member, or a benefit provision, that applies to a member who first contributed to TRS on or after January 1, 2011, and has no preexisting creditable service with a reciprocal pension system prior to January 1, 2011. “Tier I” means all other members and applicable benefit provisions.

For determining both member benefits and contribution amounts, salary for Tier II is capped at a limit that is tied to the Consumer Price Index. The initial limit was \$106,800 as of January 1, 2011. The limit increases in each subsequent year by an amount equal to the then current limit times the lesser of 3% or one-half the percentage increase in CPI-U as of the preceding September.

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

“Final average salary” means for Tier I the average salary for the highest four consecutive years within the last 10 years of creditable service, as determined under the rules of the Board. For Tier II, final average salary is for the highest eight consecutive years within the last 10 years.

Normal Retirement

Eligibility

Tier I: Age 60 with 10 years of service, or age 62 with 5 years of service

Tier II: Age 67 with 10 years of service

Amount

Tier I: For members who first became a teacher before July 1, 2005, the annual benefit amount is the greatest of (i), (ii) and (iii) below. For members who first became a teacher on or after July 1, 2005, the annual benefit amount is the greater of (i) and (ii) below.

Tier II: The annual benefit is the amount under (i) below.

- (i) For service earned before July 1, 1998, 1.67% of final average salary for each of the first 10 years of creditable service, plus 1.90% of final average salary for each year in excess of 10 but not exceeding 20, plus 2.10% of final average salary for each year in excess of 20 but not exceeding 30, and 2.30% of final average salary for each year in excess of 30. For all other service, 2.2% of final average salary.*
- (ii) 1½% of final average salary for each year of creditable service, plus \$7.50 per year for each of the first 20 years of creditable service.
- (iii) An actuarially equivalent life annuity, resulting from the member's contributions and State-matching contributions (1.4 times member contributions) plus compound interest on both.

Maximum amount under (i) and (ii) above is 75% of final average salary.

* Service earned before July 1, 1998 can be upgraded to 2.2% through additional member contributions of 1% of the member's highest salary within the last four years for each year of prior service. Maximum payment is 20% of salary, but all years are upgraded. The number of years to be upgraded is reduced by one for each three full years worked under the 2.2% formula. The 2.2% formula upgrade cost is reduced on a sliding scale for members who have more than 34 years of service credit.

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Early Retirement

Eligibility

Tier I: Age 55 with 20 years of service

Tier II: Age 62 with 10 years of service

Amount

Tier I: Equal to the amount computed under normal retirement, reduced by 6% for each year the member is under age 60. There is no reduction for a member who retires prior to age 60 with 35 years of credited service.

Tier II: Equal to the amount computed under normal retirement, reduced by 6% for each year the member is under age 67.

Rule of 85 for State Employees:

A Tier I employee of a state agency retiring on or after January 1, 2001 is entitled to a nondiscounted annuity if his or her attained age at retirement and total creditable service equal at least 85, provided he or she has (i) earned during the period immediately preceding the last day of service at least one year of contributing creditable service as a state employee and (ii) has earned at least 5 years of contributing creditable service as a state employee.

Single Sum Benefit

Eligibility

Age 65 with fewer than 5 years of creditable service after July 1, 1947

Amount

Lump sum payment actuarially equivalent to a life annuity consisting of 1.67% of final average salary for each year of service.

Temporary Disability Benefit

Eligibility

3 years of credited service

Amount

Equal to 40% of the member's most recent annual contract salary at time of disablement. The benefit is payable beginning with the 31st day after disablement and ending at the earlier of (1) cessation of disability, (2) when the member requests termination of the benefit, (3) when the period for which payments have been made equals one-fourth the period of creditable service, or (4) the member is gainfully employed or able to be gainfully employed.

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Disability Retirement Benefit

<i>Eligibility</i>	Termination of temporary disability benefit, provided member remains disabled
<i>Amount</i>	The greater of: (a) 35% of the member's most recent annual contract salary, or (b) the benefit payable for normal retirement, but reduced by 1/2% for each month by which the member is less than age 60, or age 55 if the member has 20 years of service. Other formulas may be applicable if disability retirement occurred prior to July 1, 1971.

Occupational Disability

<i>Eligibility</i>	Totally and immediately incapacitated for the performance of duty
<i>Amount</i>	Equal to 60% of salary, if disability is duty-connected or occupational adjudicated by the Illinois Industrial Commission as compensable under either the Workers' Compensation or Occupational Diseases Act. Any amounts payable under these Acts shall be applied as an offset to any occupational disability benefits payable by the Teachers' Retirement System. In general, benefits are payable throughout the period of disability.

Deferred Vested Benefits

<i>Eligibility</i>	<i>Tier I:</i> 5 years of service <i>Tier II:</i> 10 years of service
<i>Amount</i>	<i>Tier I:</i> Equal to the amount computed under normal retirement deferred to age 62, if the member has less than 10 years of service. With 10 or more years of service, the annuity is payable at age 60. <i>Tier II:</i> Equal to the amount computed under normal retirement, payable at age 67, or in a reduced amount as early as age 62. The reduction is 6% for each year the member is under age 67.

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Reversionary Retirement Annuity: Any member entitled to a retirement annuity for age may elect to receive a reduced annuity with the remainder determined on an actuarial basis to become, upon the member's death, an annuity for life to any designated person dependent upon the member at the time of the member's retirement, provided such payment shall not be less than \$10 nor more than the amount of reduced age retirement monthly annuity to which the member is entitled.

Refund of Contributions: A member who ceases to be a member for any reason other than death or retirement, shall be entitled to a refund of all retirement contributions and payments made into the System by the member which have not previously been refunded, without interest thereon.

Death Benefit: Refund of the deceased member's accumulated contributions are paid to survivors or to the member's estate. Additional lump sum death benefits are also payable:

Time of Death	Types of Beneficiaries	
	Dependents	Non-dependents
While employed	Lump sum up to last salary or \$1,000 and a monthly benefit generally not less than \$400* or \$600 with minor children**	Lump sum up to last salary
Inactive within 12 months of last day of credit	Lump sum up to last salary or \$1,000 and a monthly benefit generally not less than \$400* or \$600 with minor children**	Lump sum up to last salary
Inactive with 20 or more years of service	Lump sum of \$3,000 or 1/6 of last salary*** or \$1,000 and a monthly benefit generally 1/2 for Tier I and 2/3 for Tier II of member's earned benefit at time of death	Lump sum of \$3,000 or 1/6 of last salary***
Annuitant	Lump sum of \$3,000 or 1/6 of last salary*** or \$1,000 and a monthly benefit generally 1/2 for Tier I and 2/3 for Tier II of annuitant's earned benefit at time of death	Lump sum of \$3,000 or 1/6 of last salary***

* Certain circumstances might provide a monthly annuity less than \$400 per month for an active member.

** TRS will pay 50 percent of the member's earned retirement annuity at death if it is greater than the above amounts.

*** Certain lump sums may be greater if the annuitant or inactive member has been in retirement or out of service for less than five years.

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

**Automatic Postretirement Benefit
Cost-of-Living Adjustment**

Eligibility

Member contributed for at least an equivalent period of one full year of creditable service after July 1, 1969

Amount

For Tier I, initial increase of 1½% of base annuity for periods prior to January 1, 1972, 2% for periods from and after January 1, 1972 and prior to January 1, 1978, and 3% for periods thereafter (such periods to exclude any period of retirement that precedes attainment of age 55). Initial increase payable effective with the later of: January 1 following first anniversary of retirement; or January 1 following attainment of age 61.

Following the initial increase, automatic annual increases payable on each January 1 thereafter. Prior to January 1, 1990, annual increases were determined as a percentage of the original retirement annuity. Effective on and after January 1, 1990, automatic annual increases granted to eligible annuitants equal 3% of the total annuity being received, including previous increases granted.

For Tier II retirement and deferred vested benefits, the annual increase is equal to the original granted annuity benefit times the lesser of 3% or one-half the increase in the CPI-U as of the preceding September. The initial increase is effective January 1 after the later of attaining age 67 or the first anniversary of the annuity starting date.

For Tier I and Tier II disability benefits, the initial increase is generally 7% effective January 1 following the fourth anniversary of the initial payment and 3% annually thereafter of the then current benefit amount.

For Tier I and Tier II survivor benefits, the initial increase is effective January 1 following the first anniversary of the initial survivor payment, or after the survivor benefit has been granted benefits for survivors of annuitants, and annually thereafter. The Tier I increase is 3% of the then current benefit. The increase for Tier II is the lesser of 3% or one-half the percentage increase in CPI-U as of the preceding September of the original benefit amount.

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Member Contributions:

Beginning July 1, 1998, contributions for creditable service are made at the rate of 8% (exclusive of the 1% Survivor Benefit Contribution) of salary which is comprised of a rate of 7½% of salary towards the cost of the retirement annuity plus ½% of salary toward the cost of the automatic annual increase in retirement annuity.

Beginning July 24, 1959, each member contributes an additional 1% of salary toward Survivor's Benefits. These contributions are subject to refund if there is no dependent beneficiary at retirement, provided the member elects such refund.

Beginning July 1, 1995, each member not employed by a State agency contributes to the Teachers' Health Insurance Security Fund, administered by the Department of Central Management Services. These contributions are not refundable and do not become part of the System's assets.

Additional contributions as are necessary to receive credit for service during which contributions were not made, such as military service or service outside the System.

New Benefit Increases:

The term "new benefit increase" means an increase in the amount of any benefit provided by the statute, or the expansion of the eligibility requirements for any benefit provided by the statute, resulting from an amendment that takes place on or after June 1, 2005.

Every new benefit increase must have an identified funding source whose adequacy is verified and periodically confirmed by the Commission on Government Forecasting and Accountability (CGFA).

Every new benefit increase will automatically expire at the earlier of (i) five years after its effective date; (ii) at an earlier time specified in the amendment creating the benefit; or (iii) at the end of the fiscal year in which CGFA certifies that the identified funding source is inadequate; except that any new benefit increase will continue to apply to persons who applied for and qualified for the increase while it was in effect, and except that any new benefit increase may be extended or recreated by the General Assembly (subject to the adequacy of the funding source).

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

- Sick Leave Service Accruals:** Any unused and uncompensated accumulated sick leave is counted as creditable service provided that each former employer certifies to the System the number of unused and uncompensated accumulated sick leave days upon termination of the member. The service granted is the ratio of the number of unused and uncompensated accumulated sick leave days to 170 days, subject to a maximum of two years of service credit. The period of sick leave shall not be considered in determining the effective date of retirement.
- Guaranteed Minimum Benefit:** For members who make a small qualifying contribution, a minimum benefit of \$25 per month per year of service, up to a maximum of \$750 per month with 30 years of service, is paid. An alternate minimum retirement annuity of \$200 per month, applicable to members with at least 10 years of service, is described under 40 ILCS 5/16-136.3. The minimum benefit is payable to the extent that funds are available under the Minimum Retirement Annuity Reserve established under 40 ILCS 5/16-186.3. The Minimum Retirement Annuity Reserve is credited with qualifying contributions made by annuitants, amounts contributed by the state that are sufficient to assure payment, and interest. The reserve is charged with the minimum benefit payments.
- The portion of the retiree's benefit that is below the minimum is paid from the Benefit Trust Reserve. Only the difference between that amount and the minimum is paid from the Minimum Retirement Annuity Reserve.
- Inactive Vested Buyout:** Provides inactive vested members an option to receive an immediate lump sum in exchange for their annuity at retirement. The lump sum would be equal to 60% of the present value of future benefits. Effective for fiscal year ending June 30, 2019 to fiscal year ending June 30, 2021.
- Automatic Annual Increase Buyout:** The automatic annual increase buyout provision gives Tier I members the option to receive a lump sum at retirement in exchange for having their automatic annual increase based on 1.5% of the originally granted annuity effective at the later of January 1 following age 67 or the first anniversary of retirement. The lump sum would be equal to 70% of the difference between the present value of benefits based on the Tier I automatic annual increase and the 1.5% automatic annual increase of the originally granted annuity. Effective for fiscal year ending June 30, 2019 to fiscal year ending June 30, 2021.

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Definitions of Terms

The following list defines certain technical terms for the convenience of the reader:

Actuarial Accrued Liability For Actives:

The equivalent of the accumulated normal costs allocated to the years before the valuation date.

Actuarial Accrued Liability For Pensioners:

The single-sum value of lifetime benefits to existing pensioners. This sum takes account of life expectancies appropriate to the ages of the pensioners and the interest that the sum is expected to earn before it is entirely paid out in benefits.

Actuarial Cost Method:

A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the Actuarially Determined Contribution.

Actuarial Gain or Actuarial Loss:

A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., TRS's assets earn more than projected, salary increases are less than assumed, participants retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield in actuarial liabilities that are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.

Actuarially Equivalent:

Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Actuarial Math:	The term given to a funding policy which is designed to systematically fully fund a public employee retirement system over a reasonable amount of time.
Board-Adopted Actuarial Funding Policy:	The term given to the Board's funding policy. The contribution determined under the Board-Adopted Actuarial Funding Policy is comprised of an employer normal cost payment and a payment on the unfunded actuarial accrued liability. The amortization of the unfunded accrued liability is a closed 20-year period effective June 30, 2015, and will decline by one year in each subsequent valuation. Sources of unfunded actuarial accrued liability that emerge in subsequent valuations are amortized over 20-year closed periods. Contributions toward the unfunded actuarial accrued liability increase by 2% each year, the estimate of increase in future State revenue growth. The actuarial cost method is the entry age method. The minimum contribution is the normal cost.
Actuarial Present Value (APV):	<p>The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is:</p> <ol style="list-style-type: none">Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)Multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, andDiscounted according to an assumed rate (or rates) of return to reflect the time value of money.
Actuarial Present Value of Future Plan Benefits:	The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active participant, retired participants, beneficiaries receiving benefits, and inactive participants entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would be provide sufficient assets to pay all projected benefits and expenses when due.

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Actuarial Valuation:	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB, such as the Actuarially Determined Contribution (ADC) and the Net Pension Liability (NPL).
Actuarial Value of Assets:	The value of the System's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC.
Actuarially Determined:	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.
Actuarially Determined Contribution (ADC):	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Board's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment.
Amortization Method:	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active participants will increase.
Amortization Payment:	The portion of the pension plan contribution, or ADC, that is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Assumptions or Actuarial Assumptions:

The estimates on which the cost of the System is calculated including:

- (a) Investment return — the rate of investment yield that the System will earn over the long-term future;
- (b) Mortality rates — the death rates of employees and pensioners; life expectancy is based on these rates;
- (c) Retirement rates — the rate or probability of retirement at a given age;
- (d) Turnover rates - the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement;
- (e) Salary increase rates - the rates of salary increase due to inflation and productivity growth.

Closed Amortization Period:

A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Open Amortization Period.

Decrements:

Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.

Defined Benefit Plan:

A retirement plan in which benefits are defined by a formula applied to the member's compensation and/or years of service.

Defined Contribution Plan:

A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.

Employer Normal Cost:

The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.

Experience Study:

A periodic review and analysis of the actual experience of the System that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Funded Ratio:	The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA, as another measure of the Plan's health.
GASB 25 and GASB 27:	Governmental Accounting Standards Board Statements No. 25 and No. 27. These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 27 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 25 sets the rules for the systems themselves.
GASB 67 and GASB 68:	Governmental Accounting Standards Board Statements No. 67 and No. 68 are the successor statements to GASB Statements No. 25 and No. 27.
Investment Return:	The rate of earnings of the System from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the System. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
Net Pension Liability (NPL):	The Net Pension Liability is equal to the Total Pension Liability minus the Plan Fiduciary Net Position.
Normal Cost:	That portion of the Actuarial Present Value of plan benefits and expenses allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated.
Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount, or in relation to covered payroll, if the actuarial assumptions are realized.
Plan Fiduciary Net Position:	Market value of assets.

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

Total Pension Liability (TPL):

The actuarially accrued liability under the entry age normal cost method and based on the blended discount rate as described in GASB 67 and 68.

Unfunded Actuarial Accrued Liability (UAAL):

The excess of the actuarial accrued liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

Valuation Date or Actuarial Valuation Date:

The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

History of Legislative Changes

The actuarial cost method utilized is the projected unit credit cost method, which became effective with the June 30, 1989 valuation. Administrative expenses have been a component of the normal cost rate since the June 30, 1994 valuation. The financing objective under Article 16 of the Illinois Pension Code is to meet the cost of maintaining and administering the system on a 90% funded basis by June 30, 2045. Following is a brief summary of the changes in funding requirements.

- Public Act 88-0593, enacted in 1994, established a fifty-year funding plan for fiscal years 1996 through 2045. It required a fifteen-year ramp period of gradually increasing State contributions followed by a 35-year period of State contributions at a level percent of pay.
- Public Act 90-0448, enacted in 1997, required the System's assets to be valued at fair market value instead of book value.
- Public Act 90-0582, enacted in 1998, changed the defined benefit formula and added minimum state contribution rates in fiscal year 1999 that remained in effect through fiscal year 2004.
- Public Act 93-0002, enacted in 2003, provided pension obligation bond proceeds and placed upper limits on State contributions beginning with the State contribution due for fiscal year 2005.
- Public Act 94-0004, enacted in 2005, removed the money purchase formula for new hires, added new employer contributions for excess salary increases and sick leave, specified the level of state contributions for fiscal years 2006 and 2007, and required a return to the statutory funding plan in fiscal year 2008.
- Public Act 94-1057, enacted in 2006, contained exemptions from some of the new employer contribution requirements enacted in 2005.
- Public Act 96-0043, enacted in 2009, required the use of a smoothed actuarial value of assets beginning with the June 30, 2009 valuation.

SECTION 7: Assumptions, Benefit Provisions and Definitions for the Teachers' Retirement System of the State of Illinois

- Public Act 96-0889, enacted in 2010, established Tier II provisions.
- Public Act 96-1511, enacted in 2011, required the state retirement systems to recertify their fiscal year 2011 state funding requirements and assume the Tier II benefits of Public Act 96-0889 were in effect on June 30, 2009.
- Public Act 97-0694, enacted in 2012, required the auditor general to hire an actuary to serve as the State Actuary.
- Public Act 98-0042, enacted in 2013, provided that the Early Retirement Option terminate on June 30, 2016. Due to the expiration of the program, active members become eligible for refunds of their early retirement contributions during fiscal year 2017.
- Public Act 98-0674, enacted in 2014 as part of the budget implementation bill, requires the state and federal contribution rates to TRS to be the same.
- Public Act 99-0232, enacted in 2015, requires the actuaries of the state-funded retirement systems to conduct experience analyses every three years instead of every five years.
- Public Act 100-0023, enacted in 2017 as part of the budget implementation bill, creates a Tier III hybrid benefit plan.
- Public Act 100-0340, enacted in 2017, requires employer contributions from Federal funds to be based on the total employer normal cost rate instead of the State contribution rate, beginning July 1, 2017.
- Public Act 100-0587, enacted in 2018, creates two new buyout provisions for TRS members, an inactive vested buyout and an automatic annual increase buyout, which will exist until June 30, 2021.

A more complete history of legislative changes can be found at the following link:

<https://www.trsil.org/sites/default/files/documents/history.pdf>