

# Teachers' Retirement System of the State of Illinois

Preliminary Actuarial Valuation and Review  
of Pension Benefits as of June 30, 2017

October 19, 2017





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October 19, 2017

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, 2017, 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 experience review covering the period July 1, 2011, through June 30, 2014, and the economic experience review presented at the August 2016 Board meeting. The economic assumptions were reviewed again in June 2017, but no changes were adopted. 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 census data and the valuation date. The amount of assets in the trust fund as of the valuation date taken into account in the valuation 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 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 Actuarial Math 2.0, meets this standard.

The valuation indicates that for the fiscal year ending June 30, 2017, the actuarial experience of TRS was unfavorable, generating a net actuarial loss of \$220 million (0.2% of the actuarial accrued liability). This loss is the net result of a \$384 million gain due to favorable investment return experience and a \$604 million loss due to net unfavorable demographic experience in fiscal 2017.


**Actuarial Certification**


In preparing the results presented in this report, we have relied upon information TRS 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. Both are Fellows of the Society of Actuaries, Enrolled Actuaries, and Members of the American Academy of Actuaries, and both are experienced in performing valuations for large public retirement systems. They both meet the Qualification Standards of the American Academy of Actuaries.

Respectfully submitted,

Segal Consulting, a Member of the Segal Group

By:   
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## SECTION 1

### VALUATION SUMMARY

Overview of TRS.....	1
Significant Results of the Actuarial Valuation.....	2
Summary of Key Valuation Results .....	4
Significant Issues Facing TRS....	6
Sensitivity Projections .....	14
Important Information about Actuarial Valuations .....	16

## SECTION 2

### VALUATION RESULTS

A. Member Data.....	18
B. Financial Information .....	22
C. Actuarial Experience .....	25
D. Development of Employer Contributions .....	30

## SECTION 3

### SUPPLEMENTAL INFORMATION

EXHIBIT A – Summary of Membership Data .....	32
EXHIBIT B – Active Membership Data as of June 30, 2016 – Number and Average Annual Salary .....	35
EXHIBIT C – 10-Year History of Active Membership Data.....	36
EXHIBIT D – History of Active Membership Data by Tier.....	37
EXHIBIT E – 10-Year History of Annuitant and Survivor Annuitant Membership.....	38
EXHIBIT F – Benefit Stream for Guaranteed Minimum Annuity Reserve .....	39
EXHIBIT G – Reconciliation of Member Data.....	40
EXHIBIT H – Summary Statement of Income and Expenses on a Market Value Basis .....	41
EXHIBIT I – Summary Statement of System Assets.....	42
EXHIBIT J – History of System Revenue and Expenses .....	43
EXHIBIT K – Development of Unfunded Actuarial Accrued Liability .....	44

## SECTION 4

### REPORTING INFORMATION

EXHIBIT I Derivation of Employer Contributions under Illinois Pension Code.....	45
EXHIBIT II Development of State and Federal Funds Statutory Contributions under Illinois Pension Code .....	48
EXHIBIT III Development of State and Federal Funds Contributions Based on Actuarial Math 2.0 ...	50
EXHIBIT IV Unfunded Liability Bases .....	51
EXHIBIT V Components of Phase-in of the Effect of Assumption Changes	52
EXHIBIT VI 10-Year History of Unfunded Actuarial Liability and Funded Ratio .....	53
EXHIBIT VII Funded Ratio .....	54
EXHIBIT VIII Department of Insurance Information .....	55
EXHIBIT IX Roll Forward of Actuarial Accrued Liability and Normal Cost .....	56

## 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 .....	57
EXHIBIT XI Development of Actuarially Determined Contribution .....	58

## SECTION 5

### PROJECTIONS

Overview .....	59
TABLE 1 Projection of Funded Ratio to 2045 .....	60
TABLE 2 Projection of Contributions to Trust to 2045 .....	62
TABLE 3 Projection of Contributions to Trust to 2045 (Percent of Payroll) .....	65
TABLE 4 Projection of Employer Normal Cost and Amortization Amount to 2045 .....	67
TABLE 5 Projection of Funded Ratio to 2045 by Tier .....	71
TABLE 6 Projection of Actuarial Accrued Liability to 2045 by Member Group .....	75
TABLE 7 Projection of Total Normal Cost to 2045 by Member Group .....	76
TABLE 8 Projection of Benefit Payments to 2045 by Member Group .....	77

## SECTION 5

### PROJECTIONS (CONTINUED)

TABLE 9 Projection of Payroll to 2045 by Member Group .....	78
TABLE 10 Projection of Member Count to 2045 by Member Group .....	79
TABLE 11 Projection of Employer Normal Cost to 2045 by Member Group .....	80
TABLE 12 Projection of Debt Service to 2033 .....	81

## SECTION 6

### GASB INFORMATION

EXHIBIT 1 Schedule of Employer Contributions .....	82
EXHIBIT 2 Schedule of Funding Progress .....	84
EXHIBIT 3 Solvency Test .....	85
EXHIBIT 4 Net Pension Liability .....	86
EXHIBIT 5 Schedules of Changes in Net Pension Liability .....	88
EXHIBIT 6 Reconciliation of Collective Net Pension Liability .....	89
EXHIBIT 7 Collective Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions .....	90
EXHIBIT 8 Collective Pension Expense .....	92
EXHIBIT 9 Development of Blended Discount Rate .....	93

## SECTION 7

### ASSUMPTIONS, BENEFIT PROVISIONS AND DEFINITIONS

Summary of Assumptions and Methods .....	99
Summary of Plan Provisions ..	105
Definitions of Terms .....	114
History of Legislative Changes .....	120

## **SECTION 1: Actuarial Valuation Summary as of June 30, 2017, for the Teachers' Retirement System of the State of Illinois**

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### **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, 2017, there were 989 employers, comprised of 850 local school districts, 125 special districts, and 14 state agencies. The membership totaled over 414,000 members as of June 30, 2016. Of the 414,000 members, 118,000 are retirees and survivors to whom TRS paid over \$6.2 billion during the fiscal year ending June 30, 2017. As of June 30, 2017, the assets of TRS amounted to \$49.4 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.

### **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, 2017, for the Teachers' Retirement System of the State of Illinois**

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**SIGNIFICANT RESULTS OF THE ACTUARIAL VALUATION**

1. The contribution made during fiscal 2017 by the State, as required by the Illinois Pension Code, was insufficient to reduce the unfunded actuarial accrued liability.
2. Public Act 100-0023, enacted on July 6, 2017, modified the funding and benefit provisions as follows:
  - a. Effective with the fiscal 2018 State contribution, changes in actuarial assumptions that increase or decrease the required State contribution shall be phased in over a five-year period in equal annual installments. The effect of assumption changes that first affected the State contribution prior to 2018 will be phased in over the remaining portion of the five-year period starting in fiscal 2018.
  - b. Effective for plan years beginning on or after July 1, 2017, employers with participants who have annual earnings that currently exceed or are projected to exceed the Governor's current or projected salary are required to make an additional contribution to TRS equal to the employer normal cost rate multiplied by the amount of earnings in excess of the Governor's current or projected salary.
  - c. An optional Tier III hybrid benefit plan was established for current Tier II members and future new hires. The hybrid plan consists of two parts: a defined benefit pension, similar in design to the current Tier II benefit except that benefit accruals are lower, and a defined contribution plan with required member and employer contributions. Certain details of the Tier III funding and benefit structure are unclear, so we have not included this new optional plan in this year's valuation.
3. Public Act 100-0340, enacted on August 25, 2017, set the employer contribution rate on salaries paid from federal funds to be the employer normal cost rate effective July 1, 2017. Previously, the employer contribution rate on salaries paid from federal funds was equal to the State's contribution rate.
4. The total projected employer contribution for 2019, including State, Federal, and School Districts, is \$4.55 billion. Of this amount, \$1.05 billion, or about 23%, is for the employer portion of the normal cost and 77% is for unfunded actuarial accrued liability. The required State contribution for 2019 is \$4.47 billion, an increase from \$4.10 billion for 2018.
5. The funded ratio based on the actuarial value of assets over the actuarial accrued liability as of June 30, 2017, was 40.2%, compared to 39.8% as of June 30, 2016. This ratio is a measure of funded status, and its history is a measure of funding progress.
6. For the year ended June 30, 2017, Segal has estimated that the asset return on a market value basis was 12.39%. After gradual recognition of previous investment gains and losses under the actuarial smoothing method, the actuarial rate of return was 7.83%. This represents an experience gain when compared to the assumed rate of 7.00%. As of June 30, 2017, the actuarial value of assets (\$49.5 billion) represented 100.2% of the market value (\$49.4 billion).

**SECTION 1: Actuarial Valuation Summary as of June 30, 2017, for the Teachers' Retirement System of the State of Illinois**

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7. The investment gain on the actuarial value of assets for the year ended June 30, 2017, was \$384 million. The demographic and liability experience resulted in a \$604 million loss (0.5% of actuarial accrued liability), primarily due to more retirements than expected.
8. As page 22 of this report indicates, the total investment loss not yet recognized as of June 30, 2017, is \$92 million. These unrecognized losses 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 gains 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 losses on the actuarial value of assets in the next few years.
9. As mentioned above, the current method used to determine the actuarial value of assets yields an amount that is 100.2% of the market value of assets as of June 30, 2017. 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.
10. 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, 2017, compared to -2.5% as of June 30, 2016. Negative cash flow drains the assets of the System without investment income and may cause suboptimal investment strategies.
11. This actuarial valuation report as of June 30, 2017, is based on financial data as of that date. Changes in the value of assets subsequent to that date are not reflected.
12. The impact of using census data one year prior to the valuation date is that liability gains and losses due to demographic experience during the most recent fiscal year are reflected in the subsequent valuation. For example, the June 30, 2016 actuarial accrued liability (AAL) shown in the Summary of Key Valuation Results (\$118.6 billion) is different from the June 30, 2016 AAL shown in Exhibit IX (\$119.0 billion) because Exhibit IX is based on census data as of June 30, 2016. Therefore, if the June 30, 2016 actuarial valuation had been based on the census data as of June 30, 2016, the AAL would have been approximately \$400 million higher.
13. The GASB net pension liability (NPL) is equal to the difference between the TPL and the Plan's fiduciary net position. The NPL decreased from \$78.9 billion as of June 30, 2016, to \$76.4 billion as of June 30, 2017. This is a result of the discount rate increasing from 6.83% to 7.00%.



**SECTION 1: Actuarial Valuation Summary as of June 30, 2017, for the Teachers' Retirement System of the State of Illinois**

**Summary of Key Valuation Results**

	<b>June 30, 2017</b>	<b>June 30, 2016</b>
<b>Present Value of Future Benefits:</b>		
1. Active members	\$57,910,369,349	\$56,981,455,487
2. Retired members and beneficiaries receiving benefits	80,882,352,665	77,688,074,878
3. Inactive members with deferred benefits	<u>3,402,129,006</u>	<u>3,260,634,369</u>
4. Total: (1) + (2) + (3)	\$142,194,851,020	\$137,930,164,734
<b>Actuarial Accrued Liability:</b>		
1. Active members	\$38,619,552,597	\$37,681,181,058
2. Retired members and beneficiaries receiving benefits	80,882,352,665	77,688,074,878
3. Inactive members with deferred benefits	<u>3,402,129,006</u>	<u>3,260,634,369</u>
4. Total: (1) + (2) + (3)	\$122,904,034,268	\$118,629,890,305
<b>Funded Status:</b>		
1. Actuarial accrued liability	\$122,904,034,268	\$118,629,890,305
2. Actuarial value of assets (AVA)	<u>49,467,525,209</u>	<u>47,222,097,809</u>
3. Unfunded actuarial accrued liability (AVA basis): (1) – (2)	\$73,436,509,059	\$71,407,792,496
4. Funded ratio (AVA basis): (2) / (1)	40.2%	39.8%
5. Market value of assets (MVA)	\$49,375,664,518	\$45,250,956,731
6. Unfunded actuarial accrued liability (MVA basis): (1) – (5)	73,528,369,750	73,378,933,574
7. Funded ratio (MVA basis): (5) / (1)	40.2%	38.1%
<b>Summary of State Contributions for Fiscal Year*:</b>		
	<b>2019</b>	<b>2018</b>
1. Based on Statutory Funding Plan	\$4,466,178,109	\$4,095,316,146
2. Based on Actuarial Math 2.0	<u>7,370,930,484</u>	<u>6,993,032,528</u>
3. Difference between Actuarial Math 2.0 and Statutory Funding: (2) – (1)	\$2,904,752,375	\$2,897,716,382
4. Normal cost rate based on Statutory Funding Plan		
(a) Total (including administrative expenses)	18.85%	19.10%
(b) Member rate	<u>9.00%</u>	<u>9.00%</u>
(c) Employer: (4a) – (4b)	9.85%	10.10%

*\*The State contributions for FY2018 have been revised to reflect the funding provisions of Public Acts 100-0023 and 100-0340.*

**SECTION 1: Actuarial Valuation Summary as of June 30, 2017, for the Teachers' Retirement System of the State of Illinois**

**Summary of Key Valuation Results (continued)**

	<b>June 30, 2017</b>	<b>June 30, 2016</b>
<b>Summary of State Contributions for Fiscal Year (continued):</b>	<b>2019</b>	<b>2018</b>
5. Total normal cost based on Statutory Funding Plan		
(a) Total	\$1,980,277,506	\$1,967,800,321
(b) Administrative expenses	27,496,337	26,549,011
(c) Expected member contributions	<u>958,472,559</u>	<u>939,719,161</u>
(d) Total employer normal cost: (5a) + (5b) – (5c)	\$1,049,301,284	\$1,054,630,171
<b>GASB information:</b>		
1. Long-term expected rate of return	7.00%	7.00%
2. Municipal bond index	3.58%	2.85%
3. Single equivalent discount rate	7.00%	6.83%
4. Total pension liability	\$125,773,806,438	\$124,187,003,384
5. Plan fiduciary net position	<u>49,375,664,518</u>	<u>45,250,956,731</u>
6. Net pension liability: (4) – (5)	\$76,398,141,920	\$78,936,046,653
7. Plan fiduciary net position as a percentage of total pension liability: (5) / (4)	39.3%	36.4%
<b>Demographic data used for valuation as of June 30*:</b>	<b>2016</b>	<b>2015</b>
1. Number of active member		
(a) Full-time and regular part-time	133,505	133,478
(b) Substitute, part-time, and hourly paid	<u>26,080</u>	<u>26,206</u>
(c) Total	159,585	159,684
2. Number of inactive member		
(a) Eligible for deferred annuities	19,038	18,362
(b) Eligible for refunds or single sum benefits only	117,817	115,360
3. Number of annuitants	117,990	115,273
4. Total membership: (1) + (2a) + (2b) + (3)	414,430	408,679
5. Annual salaries		
(a) Full-time and regular part-time	\$9,450,737,426	\$9,286,852,068
(b) Substitute, part-time, and hourly paid	<u>154,723,494</u>	<u>148,554,785</u>
(c) Total	\$9,605,460,920	\$9,435,406,853
6. Annual annuities	\$6,033,050,890	\$5,728,198,886

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

## SECTION 1: Actuarial Valuation Summary as of June 30, 2017, for the Teachers' Retirement System of the State of Illinois

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### 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 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:

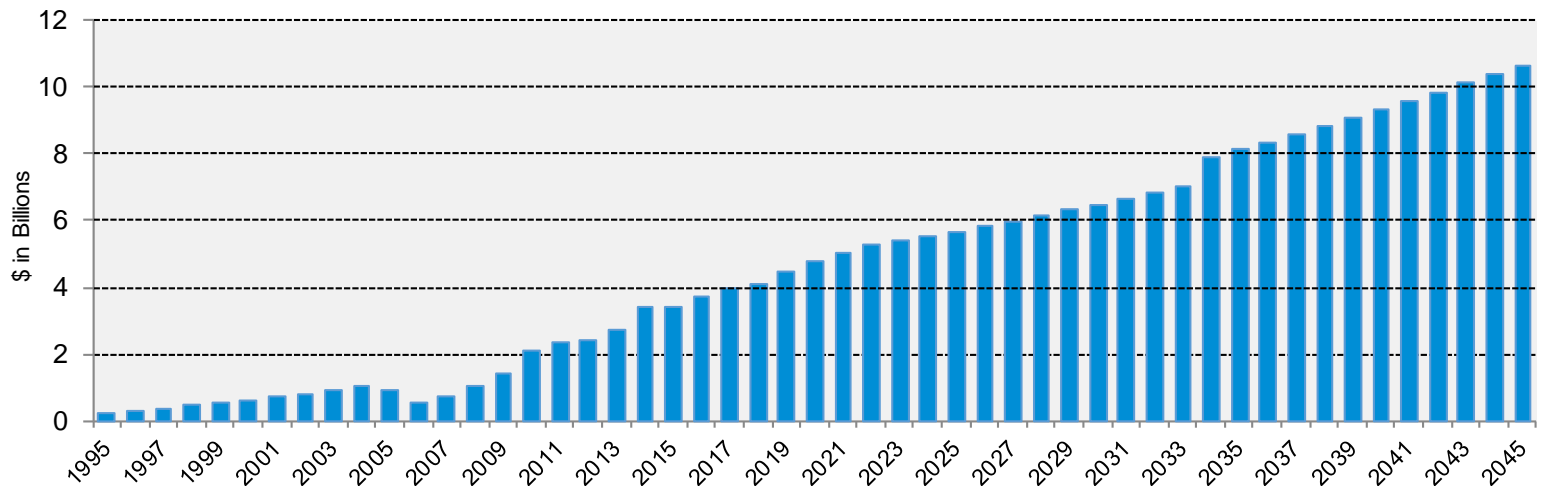
- Establishing a 50-year period in 1994, over which to amortize the Unfunded Actuarial Accrued Liability
- Back loading the 50-year period by requiring a 15-year period to ramp up to full contributions as determined under the Illinois funding policy
- Setting a funding target of 90% of the actuarial 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, 2017, 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**

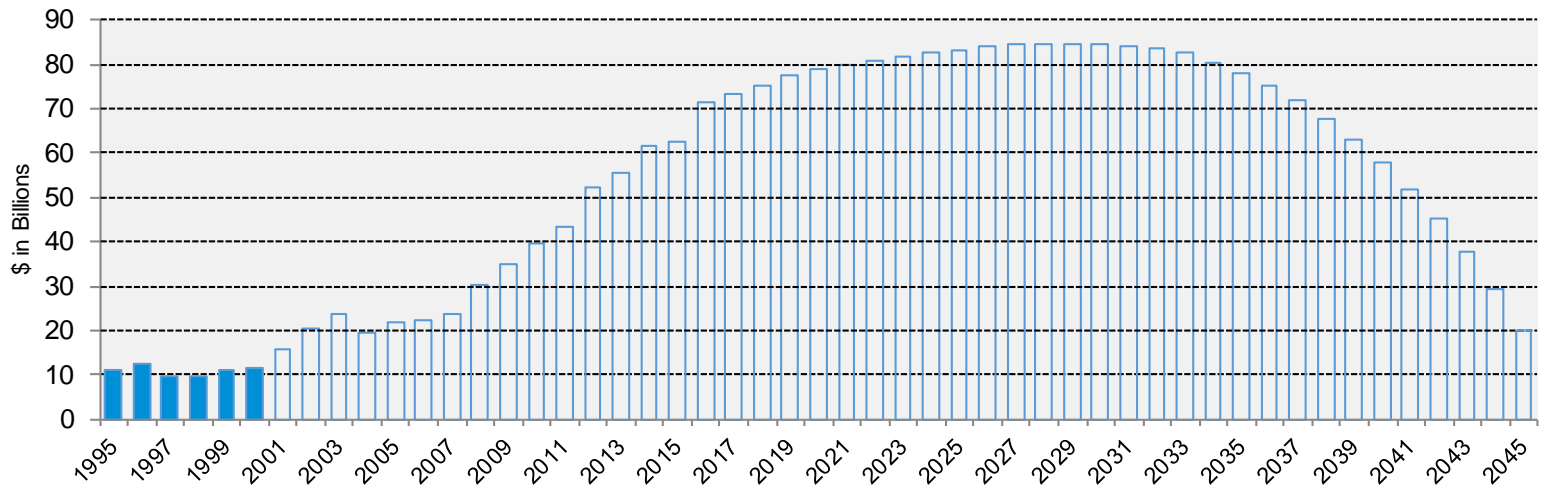


**SECTION 1: Actuarial Valuation Summary as of June 30, 2017, for the Teachers' Retirement System of the State of Illinois**

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 (“Actuarial Math 2.0”), 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 20-year closed 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, 2017, for the Teachers' Retirement System of the State of Illinois**

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The Board of Trustees prepares an annual certification, which includes State contributions under the Illinois Pension Code and Actuarial Math 2.0. Unlike the current funding policy, Actuarial Math 2.0 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 Actuarial Math 2.0, 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 2017, the limit is \$112,408. 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.

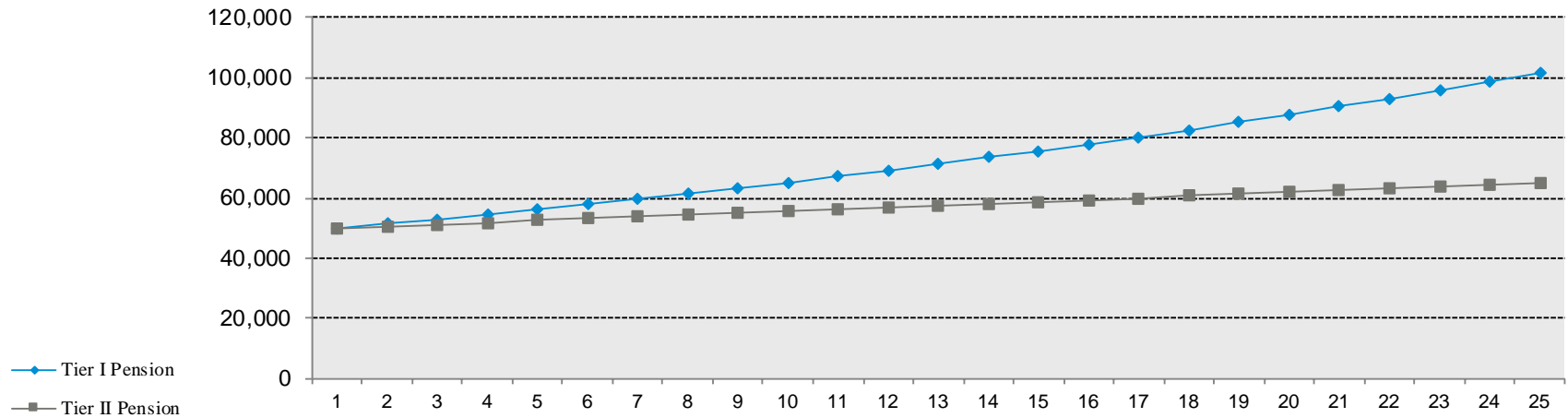
**SECTION 1: Actuarial Valuation Summary as of June 30, 2017, for the Teachers' Retirement System of the State of Illinois**

*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, 2017, 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 2019 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**

	<b>For Fiscal Year 2019</b>		
	<b>Tier I</b>	<b>Tier II</b>	<b>Total</b>
1. Total normal cost rate, including administrative expenses	21.65%	7.11%	18.85%
2. Less: member contribution rate	<u>(9.00)</u>	<u>(9.00)</u>	<u>(9.00)</u>
3. Employer normal cost rate	12.65%	(1.89%)	9.85%
4. Allocation of member contribution rate			
a. Normal cost rate	9.00%	7.11%	9.00%
b. Unfunded actuarial accrued liability	<u>0.00</u>	<u>1.89</u>	<u>0.00</u>
c. Total	9.00%	9.00%	9.00%



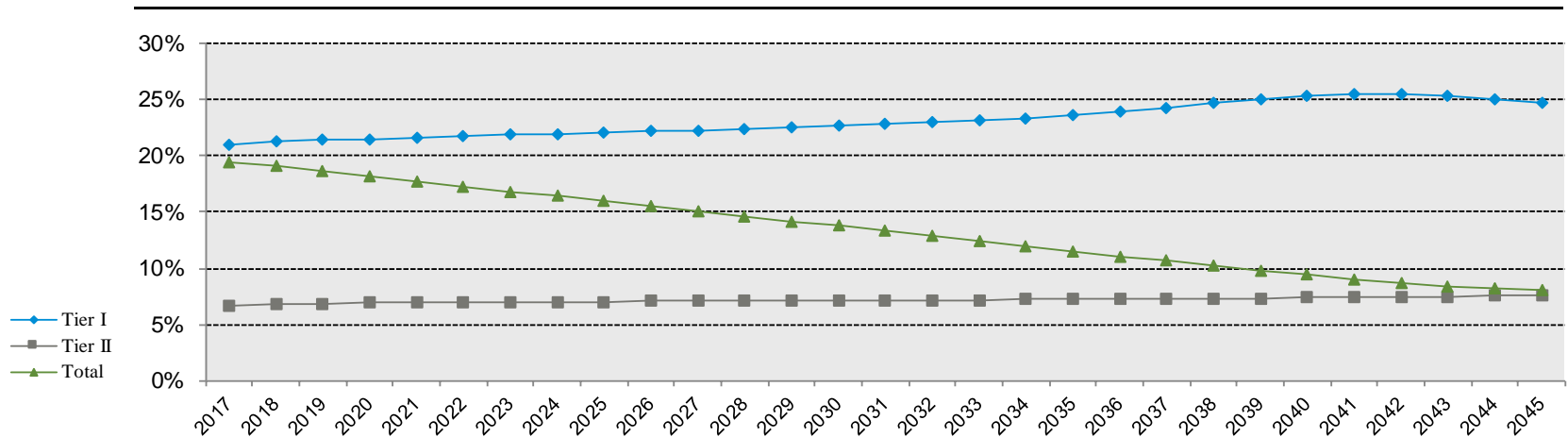
**SECTION 1: Actuarial Valuation Summary as of June 30, 2017, for the Teachers' Retirement System of the State of Illinois**

*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**

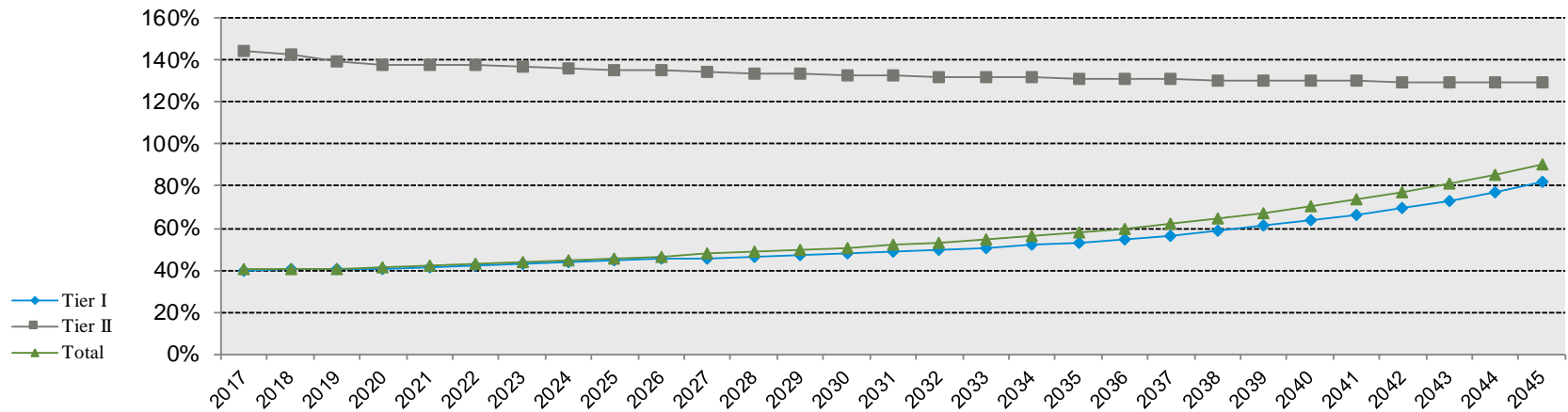


**SECTION 1: Actuarial Valuation Summary as of June 30, 2017, for the Teachers' Retirement System of the State of Illinois**

*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 144% as of June 30, 2017, decreasing slightly over time to a funded ratio of 129% as of June 30, 2045. In contrast, the Tier I funded ratio is 40% as of June 30, 2017, increasing to 82% as of June 30, 2045. For the total System, the funded ratio is 40% as of June 30, 2017, increasing to 90% as of June 30, 2045. Tier II member contributions have the effect of 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, 2017, for the Teachers' Retirement System of the State of Illinois**

**SENSITIVITY PROJECTIONS**

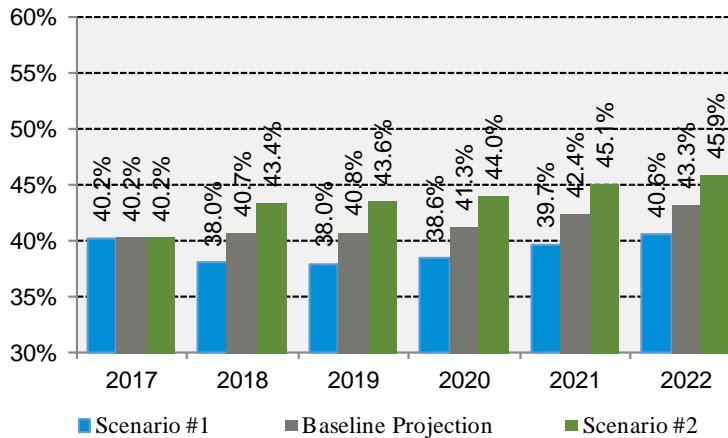
The following charts show projections of valuation results under alternative investment return scenarios. Charts G and H show projections of the funded status and State contributions for the next five years. The projections are based on the current actuarial assumptions and assume that all actuarial assumptions are realized, with the exception of the investment return for the year ending June 30, 2018:

- Scenario 1 assumes a 0% investment return for the year ending June 30, 2018
- Scenario 2 assumes a 14% investment return for the year ending June 30, 2018

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.

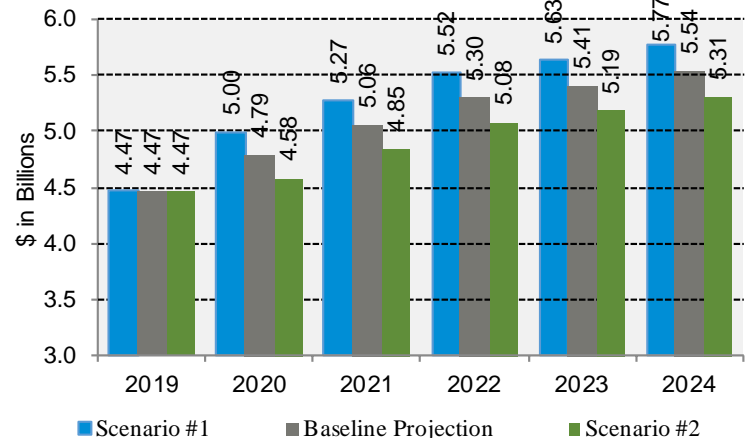
**CHART G**

**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, 2017, for the Teachers' Retirement System of the State of Illinois**

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Chart I shows the total State contributions for the fiscal years June 30, 2019, through June 30, 2045, based on the current actuarial assumptions and assume that all actuarial assumptions are realized with the exception of the investment returns as follows:

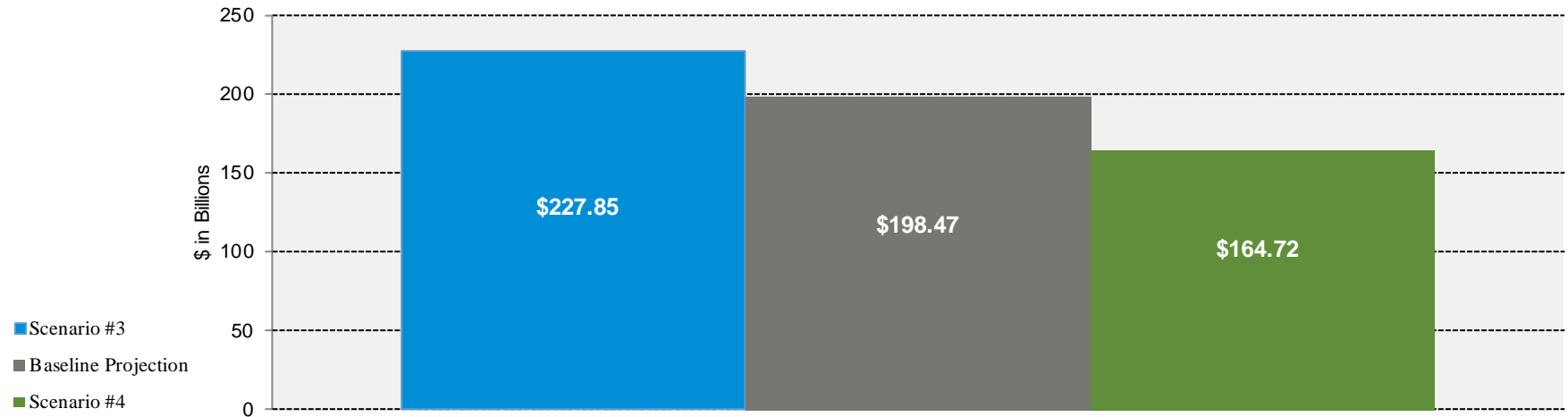
- Scenario 3 assumes investment returns of 6.00% for each year beginning with the year ending June 30, 2018, through June 30, 2045
- Scenario 4 assumes investment returns of 8.00% for each year beginning with the year ending June 30, 2018, through June 30, 2045

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**CHART I**

**Total State Contribution from Year Ending June 30, 2019, Through June 30, 2045**

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**SECTION 1: Actuarial Valuation Summary as of June 30, 2017, for the Teachers' Retirement System of the State of Illinois**

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**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, 2017, for the Teachers' Retirement System of the State of Illinois**

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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, 2017, 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 and D.

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

**CHART 1**  
**Member Population: 2007 – 2016\***

<b>June 30</b>	<b>Full-Time and Regular Part-Time Active Members</b>	<b>Substitutes, Part-Time and Hourly Paid</b>	<b>Inactive Members Eligible for Deferred Annuities</b>	<b>Inactive Members Eligible for Refunds</b>	<b>Annuitants and Survivor Annuitants</b>	<b>Ratio of Full-Time Actives to Annuitants</b>
2007	132,287	28,514	15,712	89,222	91,497	1.45
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

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

**SECTION 2: Actuarial Valuation Results as of June 30, 2017, 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, 2016 (the date as of which census data is collected for the June 30, 2017, valuation), there were 133,505 full-time and regular part-time active members with an average age of 41.8 and 12.8 average years of service. The 133,478 full-time and regular part-time active members in the prior valuation had an average age of 41.7 and 12.6 average years of service. In addition, as of June 30, 2016, there are 26,080 active members who are substitutes, part-time, and hourly paid on either a flexible or limited work schedule.

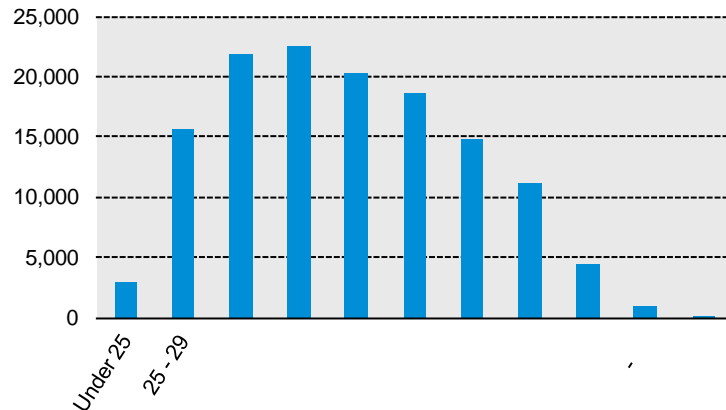
**Inactive Members**

As of June 30, 2016 (the date at which census data is collected for the June 30, 2017 valuation), there were 19,009 participants and 29 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 117,817 participants entitled to a return of their employee contributions.

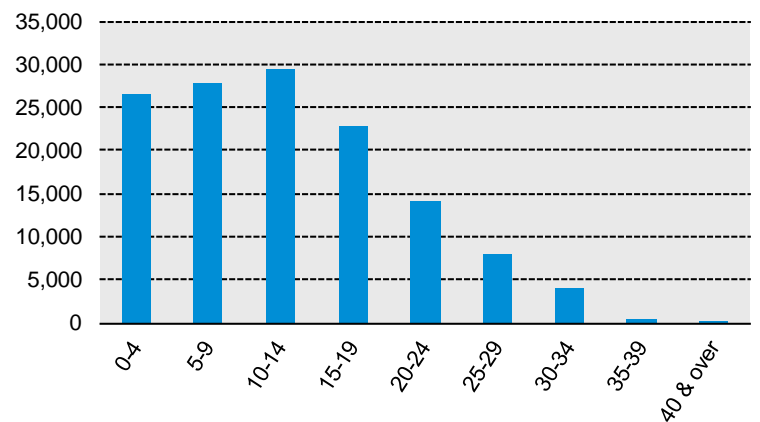
*These charts show a distribution of active participants based on years of service*

**CHART 2**  
**Distribution of Full-Time and Regular Part-Time Active Participants by Age as of June 30, 2016\***



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

**CHART 3**  
**Distribution of Full-Time and Regular Part-Time Active Participants by Years of Service as of June 30, 2016\***





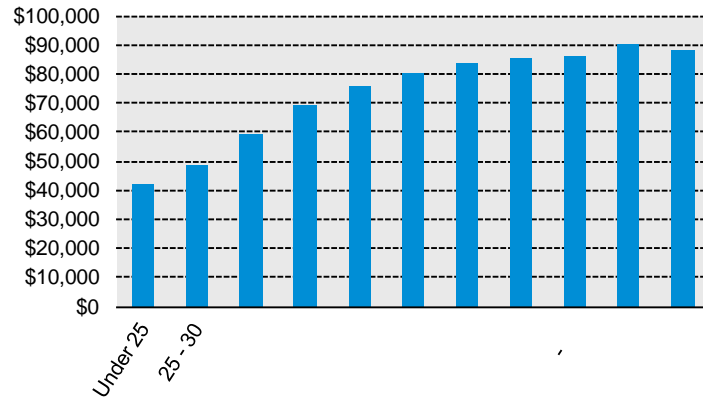
**SECTION 2: Actuarial Valuation Results as of June 30, 2017, for the Teachers' Retirement System of the State of Illinois**

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

As of June 30, 2016 (the date as of which census data is collected for the June 30, 2017 valuation), there were 133,505 full-time and regular part-time active members with an average compensation of \$70,789. The 133,478 active members used in the prior valuation had an average compensation of \$69,576.

*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, 2016\***



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

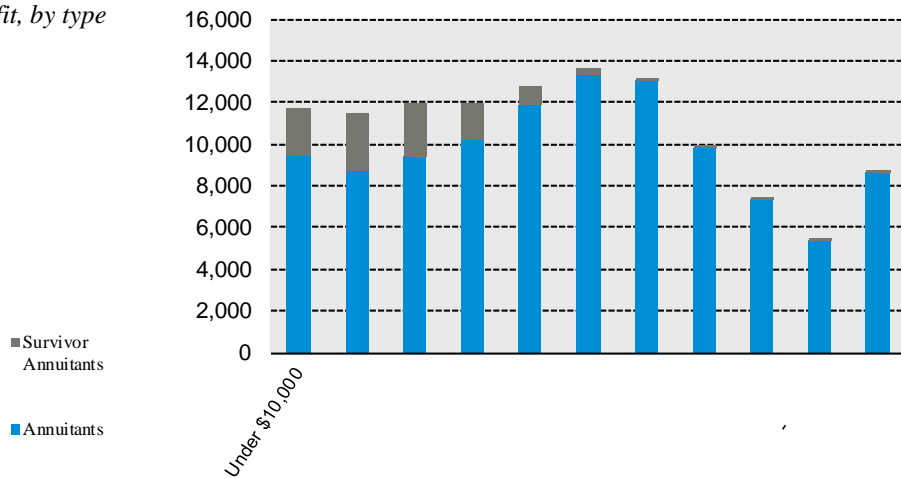
**SECTION 2: Actuarial Valuation Results as of June 30, 2017, for the Teachers' Retirement System of the State of Illinois**

**Annuitants and Survivor Annuitants**

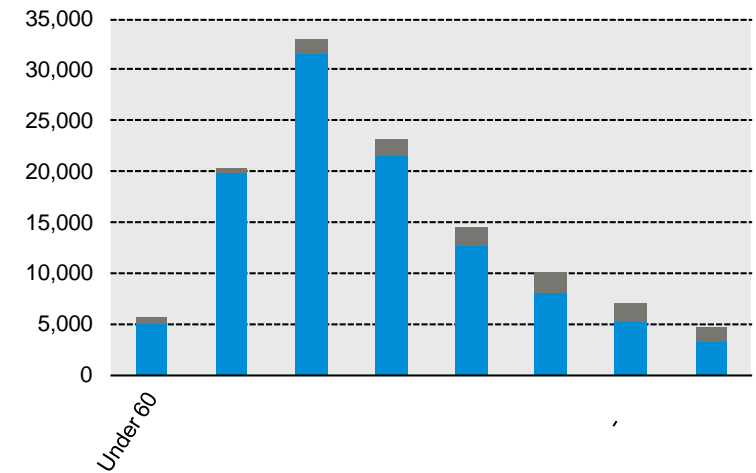
As of June 30, 2016, (the date as of which census data is collected for the June 30, 2017 valuation), 107,305 annuitants and 10,685 survivor annuitants were receiving total annual benefits of \$6,033,050,890. For comparison, in the previous valuation, there were 104,883 annuitants and 10,390 survivor annuitants were receiving total annual benefits of \$5,728,198,886.

*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, 2016\***



**CHART 6**  
**Distribution of Annuitants and Survivor Annuitants by Age as of June 30, 2016\***



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

**SECTION 2: Actuarial Valuation Results as of June 30, 2017, 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 (Actuarial Math 2.0) 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, 2017 and June 30, 2016 Actuarial Valuations**

		<b>2017</b>	<b>2016</b>
1.	Market value of assets with POB available for benefits	\$49,375,664,518	\$45,250,956,731
2.	Calculation of unrecognized return*	<u>Original Amount**</u>	<u>% Not Recognized</u>
(a)	Year ended June 30, 2017	\$2,401,737,113	80% \$1,921,389,690
(b)	Year ended June 30, 2016	(3,482,927,259)	80% (\$2,786,341,807)
(c)	Year ended June 30, 2015	(1,621,728,539)	60% (973,037,123)
(d)	Year ended June 30, 2014	3,625,986,948	40% 1,450,394,779
(e)	Year ended June 30, 2013	1,689,215,365	20% <u>337,843,073</u>
(f)	Total unrecognized return	(\$91,860,691)	(\$1,971,141,078)
3.	Actuarial value of assets with POB (Current Assets): (1) – (2f)	<u>\$49,467,525,209</u>	<u>\$47,222,097,809</u>
4.	Actuarial value as a percent of market value: (3) ÷ (1)	<u>100.2%</u>	<u>104.4%</u>
5.	Projected actuarial value of assets		
(a)	Assumed contributions	\$5,122,759,135	\$5,160,573,611
(b)	Assumed distributions	6,564,787,604	6,264,433,393
(c)	Expected return at 7.00%	3,412,255,768	3,266,911,754
(d)	Projected actuarial value of assets	<u>\$51,437,752,508</u>	<u>\$49,385,149,781</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, 2017, 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, 2017 and June 30, 2016 Actuarial Valuations**

		<b>2017</b>	<b>2016</b>
1.	Estimated market value of assets without POB available for benefits	\$44,348,296,834	\$40,445,032,097
2.	Calculation of unrecognized return* <div style="display: flex; justify-content: space-between;"> <span><u>Original Amount**</u></span> <span><u>% Not Recognized</u></span> </div>		<u>% Not Recognized</u>
(a)	Year ended June 30, 2017	\$2,152,156,362	80%
(b)	Year ended June 30, 2016	(3,104,582,596)	60%
(c)	Year ended June 30, 2015	(1,438,100,040)	40%
(d)	Year ended June 30, 2014	3,197,370,397	20%
(e)	Year ended June 30, 2013	1,480,225,815	20%
(f)	Total unrecognized return	(\$76,790,405)	80%
3.	Actuarial value of assets without POB (Current Assets): (1) – (2f)	<u>\$44,425,087,239</u>	<u>\$42,216,564,876</u>
4.	Actuarial value as a percent of market value: (3) ÷ (1)	<u>100.2%</u>	<u>104.4%</u>
5.	Projected actuarial value of assets		
(a)	Assumed contributions	\$5,486,560,788	\$5,512,798,176
(b)	Assumed distributions	6,564,787,604	6,264,433,393
(c)	Expected return at 7.00%	3,072,018,168	2,928,852,309
(d)	Projected actuarial value of assets	<u>\$46,418,878,591</u>	<u>\$44,393,781,968</u>

\* Recognition at 20% per year over 5 years

\*\*Total return minus expected return on market value

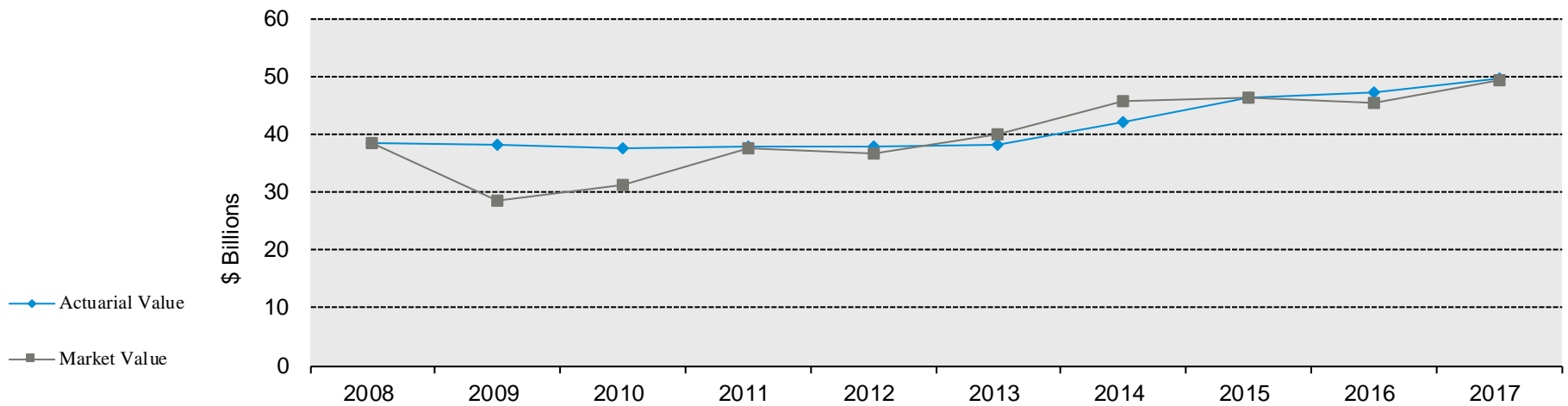
**SECTION 2: Actuarial Valuation Results as of June 30, 2017, for the Teachers' Retirement System of the State of Illinois**

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, 2008 – 2017 (with POB)**



**SECTION 2: Actuarial Valuation Results as of June 30, 2017, for the Teachers' Retirement System of the State of Illinois**

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**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 \$219,839,653; \$384,476,850 from investment gains and \$604,316,503 in losses from all other sources. The net experience variation from individual sources other than investments was approximately 0.5% 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.*

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**CHART 10**  
**Actuarial Experience for Year Ended June 30, 2017**

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1. Net gain from investments*	\$384,476,850
2. Net loss from other experience**	<u>(604,316,503)</u>
3. Net experience loss: (1) + (2)	(\$219,839,653)

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\* Details in Chart 11

\*\* Details in Chart 14

**SECTION 2: Actuarial Valuation Results as of June 30, 2017, 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, 2017, was 7.83%.

Since the actual return for the year was greater than the assumed return, TRS experienced an actuarial gain during the year ended June 30, 2017, 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, 2017**

	<b>Market Value With POB</b>	<b>Market Value Without POB</b>	<b>Actuarial Value With POB</b>
1. Value of assets as of June 30, 2016	\$45,250,956,731	\$40,445,032,097	\$47,222,097,809
2. Contributions during fiscal year ended June 30, 2017	5,064,989,441	5,417,214,006*	5,064,989,441
3. Benefits and expenses during fiscal year ended June 30, 2017	6,460,734,655	6,460,734,655	6,460,734,655
4. Value of assets as of June 30, 2017	49,375,664,518	44,348,296,834	49,467,525,209
5. Total investment income: (4) – (1) – (2) + (3)	5,520,453,001	4,946,785,386	3,641,172,614
6. Average value of assets: (1) + ((2) - (3)) ÷ 2	44,553,084,124	39,923,271,773	46,524,225,202
7. Actual rate of return: (5) ÷ (6)	12.39%	12.39%	7.83%
8. Assumed rate of return	7.00%	7.00%	7.00%
9. Expected return: (6) x (8)	\$3,118,715,888	\$2,794,629,024	\$3,256,695,764
10. Actuarial gain: (5) – (9)	<u>\$2,401,737,113</u>	<u>\$2,152,156,362</u>	<u>\$384,476,850</u>

\* Includes POB debt service

**SECTION 2: Actuarial Valuation Results as of June 30, 2017, 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**

<b>Year Ended June 30</b>	<b>Market Value</b>	<b>Actuarial Value</b>
1998	16.72%	16.72%
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
<b>Average Returns</b>		
Last 5 years:	9.0%	8.3%
Last 10 years:	4.7%	4.6%
Last 15 years:	7.2%	7.2%
Last 20 years:	6.9%	6.8%

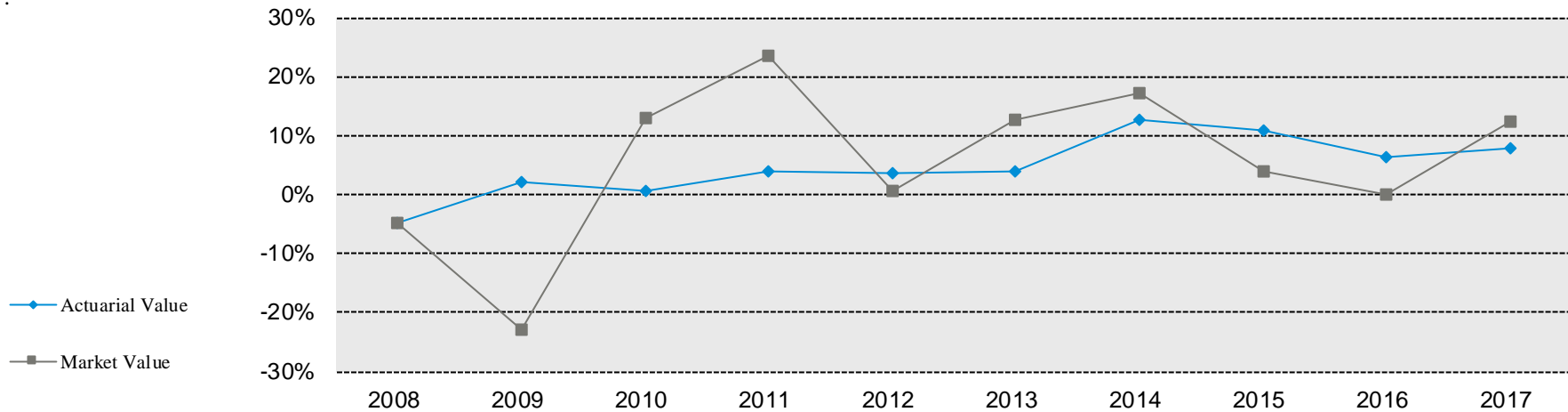


**SECTION 2: Actuarial Valuation Results as of June 30, 2017, for the Teachers' Retirement System of the State of Illinois**

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 years 2009 – 2017.*

**CHART 13**  
**Market Value and Actuarial Rates of Return for Years Ended June 30, 2008 - 2017**



**SECTION 2: Actuarial Valuation Results as of June 30, 2017, 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, 2017, amounted to \$604,316,503, which is approximately 0.5% of the actuarial accrual liability. 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, 2013 to June 30, 2017**

	Year Ended June 30				
	2017	2016	2015	2014	2013
1. Salary increases	(\$29,518,579)	\$65,504,184	\$468,541,235	\$474,190,195	\$412,776,000
2. Retirement experience	(365,965,251)	(237,492,448)	(302,761,415)	(119,675,346)	(65,579,020)
3. Disability experience	23,361,862	16,091,632	13,393,193	3,237,170	6,120,537
4. Termination experience	(25,597,354)	(15,147,793)	(56,862,195)	4,442,984	(22,925,587)
5. Mortality experience	(24,539,086)	(49,779,799)	45,647,175	74,308,199	(7,355,374)
6. Rehires	(32,789,033)	(23,266,945)	(13,630,966)	(37,754,909)	-
7. New entrants	16,627,360	17,516,646	(5,168,927)	315,731	(12,677,870)
8. Other	<u>(165,896,422)</u>	<u>(737,480,200)*</u>	<u>(21,988,860)</u>	<u>2,815,856</u>	<u>(279,656,717)</u>
9. Total	(\$604,316,503)	(\$964,054,723)	\$127,169,240	\$401,879,880	\$30,701,969

*\*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, 2017, for the Teachers' Retirement System of the State of Illinois**

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**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. The School Districts' contributions are expected to equal 0.58% of total payroll under Sec. 16-158(e), approximately 0.04% of total payroll under Sec. 16-158(f), and approximately 0.02% of total payroll under Sec. 16-158(i-5). The actuarial cost method is the projected unit credit method.

**Recommended Funding under Actuarial Math 2.0**

The Actuarially Determined Contribution under the Board's funding policy, called Actuarial Math 2.0, 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 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 Actuarial Math 2.0.

**SECTION 2: Actuarial Valuation Results as of June 30, 2017, 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 (Actuarial Math 2.0)*

**CHART 15**

**Employer Contributions**

	<b>Fiscal Year Ending June 30</b>	
	<b>2019</b>	<b>2018<sup>+</sup></b>
<b>Based on Statutory Funding Plan</b>		
1. Benefit Trust Reserve:		
a. Employer's cost as percentage of membership payroll	46.11%	45.23%
b. Total employer contribution: (1a) * (10)	\$4,910,722,093	\$4,722,255,992
c. School Districts contributions under Sec. 16-158	(68,304,290)	(67,332,353)
d. Federal Funds contribution	(20,979,899)	(21,091,475)
e. Phase-in of the effect of assumption changes	<u>(355,859,795)</u>	<u>(539,216,018)</u>
f. State Contribution: (1b) + (1c) + (1d) + (1e)	\$4,465,578,109	\$4,094,616,146
2. Guaranteed Minimum Annuity Reserve	<u>600,000</u>	<u>700,000</u>
3. Total State Contribution: (1f) + (2)	\$4,466,178,109	\$4,095,316,146
<b>Based on Actuarial Math 2.0 (Actuarially Determined Contribution)</b>		
4. Benefit Trust Reserve		
a. Normal cost plus amortization of UAAL	\$7,459,614,673	\$7,080,756,356
b. School Districts contributions under Sec. 16-158	(68,304,290)	(67,332,353)
c. Federal Funds contribution	<u>(20,979,899)</u>	<u>(21,091,475)</u>
d. State Contribution: (4a) + (4b) + (4c)	\$7,370,330,484	\$6,992,332,528
5. Guaranteed Minimum Annuity Reserve	<u>600,000</u>	<u>700,000</u>
6. Total State Contribution: (4d) + (5)	\$7,370,930,484	\$6,993,032,528
<b>Difference Between Actuarial Math 2.0 and Statutory Funding</b>		
7. Shortfall/(Excess): (6) – (3)	\$2,904,752,375	\$2,897,716,382
<b>Expected Membership Payroll</b>		
8. State payroll	\$10,436,701,198	\$10,232,497,531
9. Federal payroll	<u>212,993,902</u>	<u>208,826,480</u>
10. Total membership payroll	\$10,649,695,100	\$10,441,324,011

<sup>+</sup> Revised to reflect Public Acts 100-0023 and 100-0340

**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
	2017	2016	
<b>Active members:</b>			
1. Number			
a. Full-time and regular part-time			
Tier I	113,541	117,545	-3.41%
Tier II	<u>19,964</u>	<u>15,933</u>	25.30%
Total	133,505	133,478	0.02%
b. Substitutes, part-time, and hourly paid			
Tier I	14,721	15,953	-7.72%
Tier II	<u>11,359</u>	<u>10,253</u>	10.79%
Total	26,080	26,206	-0.48%
c. Total number of active members			
Tier I	128,262	133,498	-3.92%
Tier II	<u>31,323</u>	<u>26,186</u>	19.62%
Total	159,585	159,684	-0.06%
2. Annual salaries			
a. Full-time and regular part-time			
Tier I	\$8,496,510,578	\$8,556,153,120	-0.70%
Tier II	<u>954,226,848</u>	<u>730,698,948</u>	30.59%
Total	\$9,450,737,426	\$9,286,852,068	1.76%
b. Substitutes, part-time, and hourly paid			
Tier I	\$91,454,518	\$93,375,300	-2.06%
Tier II	<u>63,268,976</u>	<u>55,179,485</u>	14.66%
Total	\$154,723,494	\$148,554,785	4.15%
c. Total annual salaries			
Tier I	\$8,587,965,096	\$8,649,528,420	-0.71%
Tier II	<u>1,017,495,824</u>	<u>785,878,433</u>	29.47%
Total	\$9,605,460,920	\$9,435,406,853	1.80%

\*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
	2017	2016	
<b>Active members (continued):</b>			
3. Average age			
a. Full-time and regular part-time	41.8	41.7	N/A
b. Substitutes, part-time, and hourly paid	44.6	44.2	N/A
c. Total	42.2	42.1	N/A
4. Average service			
a. Full-time and regular part-time	12.8	12.6	N/A
b. Substitutes, part-time, and hourly paid	2.4	2.4	N/A
c. Total	11.1	11.0	N/A
<b>Inactive members:</b>			
Eligible for deferred annuities	19,038	18,362	3.68%
Eligible for refunds or single sum benefits	<u>117,817</u>	<u>115,360</u>	2.13%
Total	136,855	133,722	2.34%
<b>Service retirees:</b>			
1. Number			
a. Regular	71,828	68,912	4.23%
b. ERI	9,362	9,623	-2.71%
c. ERO	<u>25,024</u>	<u>25,253</u>	-0.91%
d. Total	106,214	103,788	2.34%
2. Annual annuities			
a. Regular	\$3,548,700,993	\$3,303,159,295	7.43%
b. ERI	541,899,772	541,033,711	0.16%
c. ERO	<u>1,663,152,070</u>	<u>1,624,256,799</u>	2.39%
d. Total	\$5,753,752,835	\$5,468,449,806	5.22%
3. Average age	71.3	71.0	N/A
4. Average monthly benefit	\$4,514	\$4,391	2.80%

\*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
	2017	2016	
<b>Disability annuitants:</b>			
1. Number			
a. Retirement Allowance	776	766	1.31%
b. Occupational	3	4	-25.00%
c. Temporary	<u>312</u>	<u>325</u>	-4.00%
d. Total	1,091	1,095	-0.37%
2. Annual annuities			
a. Retirement Allowance	\$20,788,436	\$20,135,885	3.24%
b. Occupational	163,085	181,372	-10.08%
c. Temporary	<u>9,232,459</u>	<u>9,298,439</u>	-0.71%
d. Total	\$30,183,980	\$29,615,696	1.92%
3. Average age	59.6	59.2	N/A
4. Average monthly benefit	\$2,306	\$2,254	2.31%
<b>Survivor annuitants:</b>			
1. Number			
a. Children	73	76	-3.95%
b. Survivors	10,408	10,109	2.96%
c. Reversionary	<u>204</u>	<u>205</u>	-0.49%
d. Total	10,685	10,390	2.84%
2. Annual annuities			
a. Children	\$837,690	\$830,687	0.84%
b. Survivors	240,534,153	221,787,418	8.45%
c. Reversionary	<u>7,742,232</u>	<u>7,515,279</u>	3.02%
d. Total	\$249,114,075	\$230,133,385	8.25%
3. Average age	77.9	77.7	N/A
4. Average monthly benefit	\$1,943	\$1,846	5.25%
<b>Total number of participants</b>	414,430	408,645	1.42%

\*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, 2016 used in June 30, 2017 Actuarial Valuation –  
Number and Average Annual Salary**

Age	Total	Full-Time and Regular Part-Time								
		Years of Service								
		0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	3,022	3,022	--	--	--	--	--	--	--	--
	\$41,884	\$41,884	--	--	--	--	--	--	--	--
25 - 29	15,543	11,389	4,154	--	--	--	--	--	--	--
	\$48,707	\$46,954	\$53,512	--	--	--	--	--	--	--
30 - 34	21,898	4,867	11,915	5,116	--	--	--	--	--	--
	\$59,201	\$50,353	\$59,195	\$67,634	--	--	--	--	--	--
35 - 39	22,523	2,542	4,579	11,385	4,017	--	--	--	--	--
	\$68,812	\$51,972	\$61,330	\$71,712	\$79,779	--	--	--	--	--
40 - 44	20,197	1,964	2,567	4,687	8,681	2,298	--	--	--	--
	\$75,872	\$52,000	\$61,420	\$72,784	\$83,204	\$91,017	--	--	--	--
45 - 49	18,666	1,354	2,039	3,135	4,161	6,230	1,747	--	--	--
	\$80,529	\$53,244	\$60,763	\$71,913	\$83,181	\$91,484	\$94,826	--	--	--
50 - 54	14,859	809	1,393	2,333	2,472	2,630	3,773	1,449	--	--
	\$83,672	\$52,805	\$60,666	\$70,636	\$80,085	\$91,258	\$96,960	\$101,761	--	--
55 - 59	11,162	437	785	1,780	2,204	1,864	1,773	2,090	229	--
	\$85,248	\$53,813	\$62,010	\$70,905	\$79,715	\$88,778	\$95,936	\$104,072	\$106,348	--
60 - 64	4,515	179	316	769	1,077	884	652	364	237	37
	\$86,323	\$53,353	\$66,986	\$74,678	\$82,439	\$91,205	\$96,895	\$105,053	\$111,622	\$116,803
65 & over	1,120	35	82	173	249	221	156	93	45	66
	\$89,962	\$54,859	\$65,665	\$82,049	\$85,965	\$92,247	\$99,917	\$103,894	\$110,971	\$109,450
Total	133,505	26,598	27,830	29,378	22,861	14,127	8,101	3,996	511	103
	\$70,789	\$48,516	\$59,279	\$71,199	\$81,918	\$91,003	\$96,327	\$103,319	\$109,201	\$112,091



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

**EXHIBIT C**

**10-Year History of Active Membership Data**

<b>Full-Time and Regular Part-Time</b>					
<b>Census Date June 30</b>	<b>Number</b>	<b>Percentage Change in Membership</b>	<b>Total Salaries</b>	<b>Average Annual Salary</b>	<b>Percentage Change in Average Salary</b>
2007	132,287	1.1%	\$8,163,840,000	\$61,713	2.9%
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%

<b>Substitutes, Part-Time and Hourly-Paid</b>					
<b>Census Date June 30</b>	<b>Number</b>	<b>Percentage Change in Membership</b>	<b>Total Salaries</b>	<b>Average Annual Salary</b>	<b>Percentage Change in Average Salary</b>
2007	28,514	0.6%	\$139,440,000	\$4,890	2.2%
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%

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

**EXHIBIT D**

**History of Active Membership Data by Tier**

<b>Tier I</b>					
<b>Census Date June 30</b>	<b>Number</b>	<b>Percentage Change in Membership</b>	<b>Total Salaries</b>	<b>Average Annual Salary</b>	<b>Percentage Change in Average Salary</b>
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%

<b>Tier II</b>					
<b>Census Date June 30</b>	<b>Number</b>	<b>Percentage Change in Membership</b>	<b>Total Salaries</b>	<b>Average Annual Salary</b>	<b>Percentage Change in Average Salary</b>
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%

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**

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**EXHIBIT E**

**10-Year History of Annuitant and Survivor Annuitant Membership**

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<b>Valuation as of June 30</b>	<b>Number</b>	<b>Percentage Change in Number of Recipients</b>	<b>Annual Allowances</b>	<b>Percentage Change in Allowances</b>	<b>Average Annual Annuity</b>
2007	91,497	2.5%	\$3,549,173,000	6.2%	\$38,790
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

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

**EXHIBIT F  
Benefit Stream for Guaranteed Minimum Annuity Reserve**

<b>Fiscal Year</b>	<b>Projected Benefit Stream for Guaranteed Minimum Annuity Reserve</b>	<b>Fiscal Year</b>	<b>Projected Benefit Stream for Guaranteed Minimum Annuity Reserve</b>
2018	\$537,781	2041	\$15,854
2019	480,787	2042	13,050
2020	425,213	2043	10,672
2021	373,307	2044	8,664
2022	326,051	2045	6,977
2023	283,692	2046	5,568
2024	246,184	2047	4,398
2025	213,014	2048	3,437
2026	183,995	2049	2,653
2027	158,612	2050	2,021
2028	136,582	2051	1,518
2029	117,442	2052	1,123
2030	100,848	2053	817
2031	86,469	2054	586
2032	73,974	2055	414
2033	63,189	2056	289
2034	53,848	2057	200
2035	45,765	2058	138
2036	38,761	2059	96
2037	32,701	2060	56
2038	27,485	2061	39
2039	22,997	2062	28
2040	19,146	2063	21

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

**EXHIBIT G  
Reconciliation of Member Data**

	<b>Active Members</b>	<b>Inactive Member Eligible for Allowance</b>	<b>Inactive Member Eligible for Refund</b>	<b>Service Retirees</b>	<b>Disabled Retirees</b>	<b>Beneficiaries</b>	<b>Deferred Beneficiaries</b>	<b>Total</b>
A. Number as of June 30, 2015	159,684	18,328	115,360	103,788	1,095	10,390	34	408,679
B. New members	10,583	N/A	N/A	N/A	N/A	N/A	N/A	10,583
C. Participant movement								
1. Retirements	(3,702)	(619)	(217)	4,538	0	0	0	0
2. Disabilities	(114)	(2)	0	0	116	0	0	0
3. Conversion from disability to service pension	N/A	N/A	N/A	35	(35)	N/A	N/A	0
4. Died with beneficiary	(42)	(1)	(2)	(730)	(17)	878	3	89*
5. Died without beneficiary	(60)	(13)	(184)	(1,414)	(21)	(576)	(1)	(2,269)
6. Terminations – with vested rights	(2,619)	2,619	0	0	0	0	0	0
7. Terminations – without vested rights	(7,863)	0	7,863	0	0	0	0	0
8. Refunds	(685)	(298)	(1,627)	N/A	N/A	N/A	0	(2,610)
9. Rehired as active	4,480	(1,012)	(3,428)	(2)	(38)	0	0	0
10. Temporary annuity expired	N/A	N/A	NA	N/A	N/A	(7)	N/A	(7)
D. Data adjustment	<u>(77)</u>	<u>7</u>	<u>52</u>	<u>(1)</u>	<u>(9)</u>	<u>0</u>	<u>(7)</u>	<u>(35)</u>
E. Number as of June 30, 2016	159,585	19,009	117,817	106,214	1,091	10,685	29	414,430

\* 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, 2017	Year Ended June 30, 2016
<b>Net assets at market value at the beginning of the year</b>	\$45,250,956,731	\$46,406,915,593
<b>Contribution income:</b>		
Members	\$929,130,165	\$951,809,398
State of Illinois	3,986,363,699	3,742,469,245
Employers:		
Early retirement	10,776,747	13,554,467
Federal funds	75,694,656	74,497,870
2.2 Benefit formula	57,964,519	55,785,482
Excess salary/sick leave	<u>5,059,655</u>	<u>4,202,948</u>
Total contribution income	\$5,064,989,441	\$4,842,319,410
<b>Investment income:</b>		
Net appreciation (depreciation)	\$4,676,047,504	(\$843,377,824)
Alternative	897,514,621	808,469,675
Interest and dividends	685,696,063	676,266,855
Other	23,479,101	47,074,975
Securities lending	17,308,948	18,162,018
Less alternatives expense	(428,905,050)	(418,308,185)
Less direct investment expense	(349,649,601)	(331,300,958)
Less securities lending management fees	<u>(1,038,585)</u>	<u>(1,089,734)</u>
Net investment income	<u>5,520,453,001</u>	<u>(44,103,178)</u>
<b>Total income available for benefits</b>	<b>\$10,585,442,442</b>	<b>\$4,798,216,232</b>
<b>Less benefit payments and administrative expenses:</b>		
Retirement benefits	(\$5,857,968,199)	(\$5,575,129,529)
Survivor benefits	(263,429,481)	(242,578,458)
Disability benefits	(31,470,071)	(30,472,221)
Refund of contributions	(285,138,169)	(83,026,969)
Administrative expenses	<u>(22,728,735)</u>	<u>(22,967,917)</u>
Net benefit payments and administrative expenses	(\$6,460,734,655)	(\$5,954,175,094)
<b>Net assets at market value at the end of the year</b>	<b>\$49,375,664,518</b>	<b>\$45,250,956,731</b>

**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, 2017	Year Ended June 30, 2016
<b>Cash equivalents</b>	\$38,331,642	\$40,637,848
<b>Accounts receivable and prepaid expenses:</b>		
Member contributions	\$54,778,150	\$53,246,316
Employer contributions	13,508,665	14,904,808
State of Illinois	492,161,607	473,533,699
Investment income	114,926,644	110,892,567
Investments sold	9,381,897,730	4,622,648,071
Prepaid expenses	<u>2,318,900</u>	<u>4,338,705</u>
Total accounts receivable and prepaid expenses	\$10,059,591,696	\$5,279,564,166
<b>Investments at market value:</b>		
Fixed income	\$10,552,182,948	\$9,887,153,436
Public equities	17,480,643,235	16,083,525,866
Alternative investments	19,838,883,828	18,494,303,800
Derivatives	3,427,917	(62,716,360)
Short-term investments	1,223,393,259	1,127,440,142
Foreign currency	<u>81,744,713</u>	<u>103,219,472</u>
Total investments	<u>\$49,180,275,900</u>	<u>\$45,632,926,356</u>
<b>Invested securities lending collateral</b>	3,268,211,165	3,134,036,175
<b>Capital assets, net of accumulated depreciation</b>	2,913,530	3,605,993
<b>Total assets</b>	\$62,549,323,933	\$54,090,770,538
<b>Less accounts payable:</b>		
Benefits and refunds payable	(\$8,523,543)	(\$5,958,467)
Administrative and investment expenses payable	(42,699,505)	(53,025,784)
Pending investment purchases	(9,854,244,522)	(5,646,802,204)
Securities lending collateral	<u>(3,268,191,845)</u>	<u>(3,134,027,352)</u>
Total accounts payable	(\$13,173,659,415)	(\$8,839,813,807)
<b>Net assets at market value</b>	<u>\$49,375,664,518</u>	<u>\$45,250,956,731</u>

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

**EXHIBIT J**

**History of System Revenue and Expenses**

<b>Year Ending June 30</b>	<b>Market Value of Assets Beginning of Year</b>	<b>Member Contributions</b>	<b>Employer Contributions</b>	<b>Net Investment Return</b>	<b>Admin Expenses</b>	<b>Benefit Payments</b>	<b>Market Value of Assets End of Year</b>	<b>Investment Return*</b>
2008	\$41,909,317,751	\$865,400,168	\$1,171,788,454	(\$2,014,902,366)	\$16,613,364	\$3,484,267,356	\$38,430,723,287	(5.0%)
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%

\* 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	
	2017	2016
1. Unfunded actuarial accrued liability at beginning of year	\$71,407,792,496	\$62,686,632,526
2. Total normal cost at beginning of year	1,917,029,641	1,820,919,242
3. Total member and employer contributions	5,063,662,107	4,842,319,410
4. Interest on:		
(a) Unfunded actuarial accrued liability and normal cost	\$5,132,737,550	\$4,838,066,383
(b) Total contributions	<u>177,228,174</u>	<u>181,586,978</u>
(c) Total interest: (4a) – (4b)	<u>4,955,509,376</u>	<u>4,656,479,405</u>
5. Expected unfunded actuarial accrued liability: (1) + (2) – (3) + (4c)	\$73,216,669,406*	\$64,321,711,763
6. Changes due to (gain)/loss from:		
(a) Investments	(384,476,850)	467,184,012
(b) Demographics	<u>604,316,503</u>	<u>964,054,723</u>
(c) Total changes due to (gain)/loss: (6a) + (6b)	<u>219,839,653</u>	<u>1,431,238,735</u>
7. Change due to plan amendments	0	0
8. Change in actuarial assumptions	<u>0</u>	<u>5,654,841,998</u>
9. Unfunded actuarial accrued liability at end of year: (5) + (6c) + (7) + (8)	<u>\$73,436,509,059</u>	<u>\$71,407,792,496</u>

\* The unfunded actuarial accrued liability increased \$1,808,876,910 during the year ended June 30, 2017 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, 2019	As Percentage of Payroll (Federal, Total)	
1. Assumed Payroll:			
a. Total payroll	\$10,649,695,100		
b. Less Federal Funds payroll	<u>(212,993,902)</u>		
c. State payroll	\$10,436,701,198		
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	\$5,285,457,251	49.63%	Total
b. Less School Districts' contributions under Sec. 16-158	<u>(68,304,290)</u>	<u>(0.64%)</u>	Total
c. State and Federal Funds contribution	\$5,217,152,961	48.99%	Total
d. Less State debt service for TRS portion of all funds provided under Sec 7.2 of General Obligation Bond Act	<u>(374,735,158)</u>	<u>(3.52%)</u>	Total
e. Maximum State and Federal Funds contribution under PA 94-0004	\$4,842,417,803	45.47%	Total
3. Employer contribution recognizing all system assets, before limiting State and Federal Funds contribution			
a. Employer's cost	\$4,977,748,474	46.74%	Total
b. Less School Districts' contributions under Sec. 16-158	<u>(68,304,290)</u>	<u>(0.64%)</u>	Total
c. State and Federal Funds contribution	\$4,909,444,184	46.10%	Total
4. State and Federal Funds contribution under PA 100-0023			
a. Lesser of amounts under (2) and (3)	\$4,842,417,803	45.47%	Total
b. Less phase-in of the effect of assumption changes	(355,859,795)	(3.34%)	Total
c. Less Federal Funds contribution under PA 100-0340	<u>(20,979,899)</u>	<u>(9.85%)</u>	Federal
d. State contribution	\$4,465,578,109	41.93%	Total
5. Employer contributions			
a. State contribution	\$4,465,578,109	41.93%	Total
b. Plus Federal Funds contribution	<u>20,979,899</u>	9.85%	Federal
c. State and Federal Funds contribution	\$4,486,558,008	42.13%	Total
d. Plus School Districts' contributions under Sec. 16-158	<u>68,304,290</u>	0.64%	Total
e. Employer contribution	\$4,554,862,298	42.77%	Total

**Notes about employer contributions:**

**1) Assumed Payrolls**

TRS staff estimated that Federal Funds payroll for the fiscal year ending June 30, 2019 would be 2.00% of 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 2019, the expected School Districts' contributions under Sec. 16-158(e), 16-158(f), and 16-158(i-5) are \$61,768,232, \$4,150,160, and \$2,385,898, 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

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### 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).

**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**

	<b>Fiscal Year Ending June 30, 2019</b>
1. Present value as of June 30, 2018 of future obligations to fund:	
a. 90% of June 30, 2045 Actuarial Accrued Liability	\$28,976,728,793
b. Benefit disbursements and administrative expenses through June 30, 2045	<u>119,283,143,370</u>
c. Total	\$148,259,872,163
2. Projected actuarial value of assets as of June 30, 2018	
a. With POB proceeds	51,437,752,508
b. Without POB proceeds	46,418,878,591
3. Present value as of June 30, 2018 of future member contributions through June 30, 2045	15,633,135,230
4. Present value as of June 30, 2018 of future School district contributions through June 30, 2045	
a. 2.2% formula under §16-158(e)	\$1,007,468,715
b. 6% FAS cap increases under §16-158(f)	62,140,892
c. Salaries above the Governor's under §16-158(i-5)	<u>44,046,512</u>
d. Total	\$1,113,656,119
5. Present value as of June 30, 2018 of future State and Federal Funds contributions through June 30, 2045	
a. Including POB proceeds: (1c) – (2a) – (3) – (4d)	80,075,328,306
b. Excluding POB proceeds: (1c) – (2b) – (3) – (4d)	85,094,202,223
6. Present value as of June 30, 2018 of future covered payroll through June 30, 2045	173,701,502,554
7. Determination of preliminary contribution rates for State and Federal Funds for year ended June 30, 2019	
a. Including POB proceeds: (5a) / (6)	46.10%
b. Excluding POB proceeds: (5b) / (6)	48.99%

**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**

	<b>Fiscal Year Ending June 30, 2019</b>
8. Determination of contribution for State and Federal Funds for year ending June 30, 2019:	
a. Projected payroll:	
i) State	\$10,436,701,198
ii) Federal Funds	<u>212,993,902</u>
iii) Total	\$10,649,695,100
b. State and Federal Funds contribution before maximum:	
i) Gross contribution: (7a) x (8a)(iii)	\$4,909,444,184
ii) Phase-in of the effect of assumption changes	<u>355,859,795</u>
iii) Net contribution: (i) – (ii)	\$4,553,584,389
c. State and Federal Funds contribution maximum:	
i) Gross maximum: (7b) x (8a)(iii)	\$5,217,152,961
ii) State's debt service	374,735,158
iii) Phase-in of the effect of assumption changes	<u>355,859,795</u>
iv) Net contribution: (i) – (ii) – (iii)	\$4,486,558,008
e. State and Federal Funds contribution after maximum:	
i) Total dollar contribution: minimum of (8b)(iii) and (8c)(iv)	\$4,486,558,008
ii) Federal Funds contribution	<u>20,979,899</u>
iii) State contribution: (i) – (ii)	\$4,465,578,109

**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 Actuarial Math 2.0**

	<b>Fiscal Year Ending June 30, 2019</b>
1. Projected employer Normal Cost for year ending June 30, 2019	
a. Total	\$1,876,738,262
b. Administrative expenses	27,496,337
c. Member contributions	<u>958,472,559</u>
d. Employer Normal Cost: (a) + (b) – (c)	\$945,762,040
2. Projected Unfunded Actuarial Accrued Liability as of June 30, 2018	
a. Actuarial Accrued Liability	\$129,735,893,146
b. Actuarial Value of Assets	<u>51,437,752,508</u>
c. Unfunded Actuarial Accrued Liability: (a) – (b)	\$78,298,140,638
3. Payment toward projected Unfunded Actuarial Accrued Liability for year ending June 30, 2019 (see Exhibit IV)	6,513,852,633
4. Total employer contribution for year ending June 30, 2019: (1d) + (3)	\$7,459,614,673
5. Projected School district contributions for year ending June 30, 2019	
a. 2.2% formula under §16-158(e)	\$61,768,232
b. 6% FAS cap increases under §16-158(f)	4,150,160
c. Salaries above the Governor's under §16-158(i-5)	<u>2,385,898</u>
d. Total	\$68,304,290
6. State and Federal contribution for year ending June 30, 2019: (4) – (5d)	\$7,391,310,383
7. Federal Funds contribution for year ending June 30, 2019	20,979,899
8. State contribution for year ending June 30, 2019: (6) – (7)	\$7,370,330,484

**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 Actuarial Math 2.0**

	<b>Original Amount</b>	<b>Balance as of June 30, 2018</b>	<b>Remaining Amortization Period</b>	<b>2019 Amortization</b>
June 30, 2015 valuation base:				
Projected UAAL as of June 30, 2016	\$68,126,860,208	\$66,552,230,223	18	\$5,571,072,040
June 30, 2016 valuation base:				
Projected (gain)/loss as of June 30, 2017	\$8,625,889,107	8,529,551,367	19	690,397,741
June 30, 2017 valuation base:				
Projected (gain)/loss as of June 30, 2018	\$3,216,359,048	<u>3,216,359,048</u>	20	<u>252,382,852</u>
Total		\$78,298,140,638		\$6,513,852,633



**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 Effected	Effect on State Contribution	Phase in of the Effect of Assumption Changes for Fiscal Year				
			2018	2019	2020	2021	2022
2012	2014	\$335,329,627	--	--	--	--	--
2013	2015	--	--	--	--	--	--
2014	2016	464,263,256	(\$185,705,302)	(\$92,852,651)	--	--	--
2015	2017	42,517,859	(25,510,716)	(17,007,144)	(\$8,503,572)	--	--
2016	2018	410,000,000	(328,000,000)	(246,000,000)	(164,000,000)	(\$82,000,000)	--
2017	2019	--	--	--	--	--	--
Total			(\$539,216,018)	(\$355,859,795)	(\$172,503,572)	(\$82,000,000)	--

**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)**

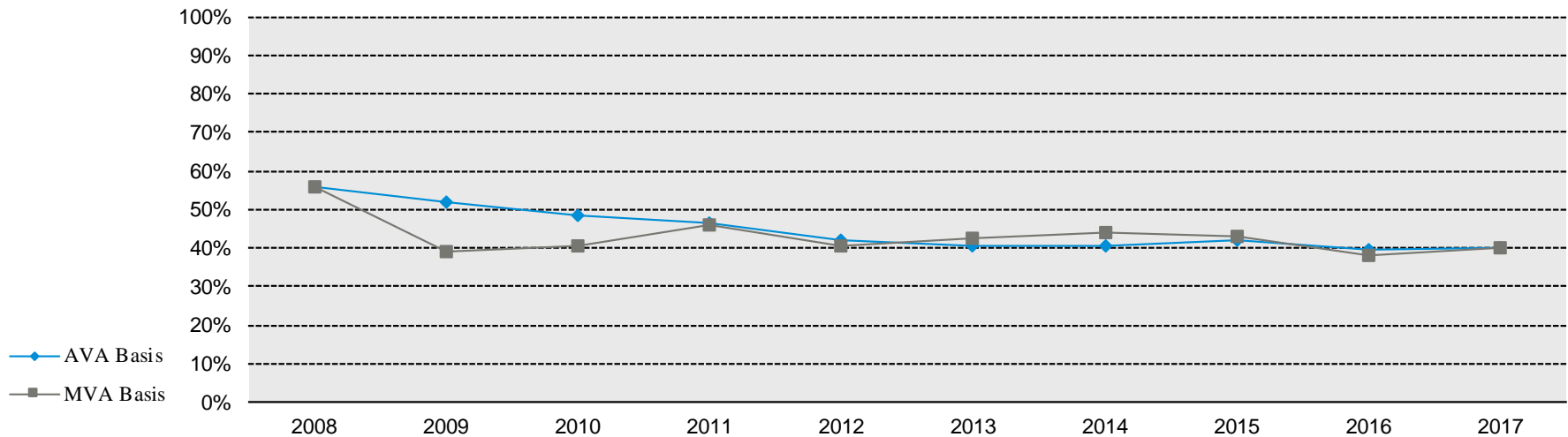
As of June 30	Assets			Unfunded Liability Using Assets Based on		Funded Ratio Using Assets Based on	
	Actuarial Accrued Liability	Actuarial Value of Assets	Market Value of Assets	Actuarial Value of Assets	Market Value of Assets	Actuarial Value of Assets	Market Value of Assets
2008	\$68,632,367	\$38,430,723	\$38,430,723	\$30,201,644	\$30,201,644	56.0%	56.0%
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	55,731,797	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

**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**

	<b>June 30, 2017</b>	<b>June 30, 2016</b>
<b>Actuarial Accrued Liabilities:</b>		
Service Retirement	\$78,294,683,525	\$75,251,548,496
Disability Retirement	420,772,598	412,320,378
Survivor	<u>2,166,896,542</u>	<u>2,024,206,004</u>
Subtotal	\$80,882,352,665	\$77,688,074,878
Inactive	3,402,129,006	3,260,634,369
Active	<u>38,619,552,597</u>	<u>37,681,181,058</u>
Total	\$122,904,034,268	\$118,629,890,305
<b>Headcounts and Salaries for Active Members:</b>		
Male		
Count	37,430	37,415
Salaries	\$2,577,047,700	\$2,523,476,544
Female		
Count	122,155	122,269
Salaries	\$7,028,413,220	\$6,911,930,308
Total		
Count	159,585	159,684
Salaries	\$9,605,460,920	\$9,435,406,853

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

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**EXHIBIT IX**

**Roll Forward of Actuarial Accrued Liability and Normal Cost**

<b>Actuarial Accrued Liabilities Developed for June 30, 2017 Valuation</b>	<b>Amount</b>
1. Actuarial Accrued Liability measured as of June 30, 2016	\$119,018,393,487
2. Normal Cost measured for fiscal year ended June 30, 2017	1,893,503,120
3. Expected benefit payments for fiscal year ended June 30, 2017	6,252,845,509
4. Interest on 1., 2. and 3. to June 30, 2017	8,244,983,170
5. Actuarial Accrued Liability as of June 30, 2017 (1) + (2) – (3) + (4)	\$122,904,034,268
6. Normal Cost measured for fiscal year ended June 30, 2018	1,904,024,784
7. Expected benefit payments for fiscal year ended June 30, 2018	6,538,238,593
8. Interest on 5., 6. and 7. to June 30, 2018	8,507,725,783
9. Actuarial Accrued Liability as of June 30, 2018 (5) + (6) – (7) + (8)	\$126,777,546,242

*Based on member census as of June 30, 2016, assumptions and methods as of June 30, 2017, including the Projected Unit Credit actuarial cost method.*

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

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**EXHIBIT X**

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

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	<b>Fiscal Year 2019</b>
1. Employer normal cost plus interest on UAAL	
a. Employer normal cost	\$1,049,301,284
b. Interest on the projected June 30, 2018 UAAL	<u>5,083,393,935</u>
c. Total employer normal cost plus interest on UAAL	6,132,695,219
2. Contributions from sources other than State and Federal Funds	
a. School District contributions under §16-158(e)	(\$61,768,232)
b. School District contributions under §16-158(f)	(4,150,160)
c. School District contributions under §16-158(i-5)	<u>(2,385,898)</u>
d. Total contributions from sources other than State and Federal Funds	(68,304,290)
3. State and Federal Funds share of normal cost plus interest on UAAL	
a. State's share	\$6,043,299,454
b. Federal Fund's share	<u>21,091,475</u>
c. Total share	\$6,064,390,929
4. State contribution requirement	
a. State's share of normal cost plus interest on UAAL	\$6,043,299,454
b. Guaranteed Minimum Annuity Reserve contribution	<u>600,000</u>
c. Total State contribution requirement	\$6,043,899,454

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

**EXHIBIT XI**

**Development of Actuarially Determined Contribution (ADC)**

**ADC (\$ in thousands)**

	<b>Fiscal Year Ended June 30, 2017</b>
<b>Development of the ADC:</b>	
1. Employer Normal Cost	\$755,238
2. Amortization of Unfunded Actuarial Accrued Liability	<u>5,493,641</u>
3. Actuarially Determined Contribution: (1) + (2)	<u>\$6,248,879</u>

The ADC for fiscal year ending June 30, 2017, is based on the valuation date of June 30, 2015, prepared by Buck Consultants.

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	7.50%
Projected Salary Increases	3.75% – 9.75%; composite approximates 5.25%
Includes Inflation at:	3.00%
Post-retirement Increase:	Tier I 3% compounded Tier II 1.4% not compounded (lesser of 3% or 1/2 CPI increase, but not less than zero)

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

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### Projections – Overview

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Based on the results of the June 30, 2017, actuarial valuation, we have projected valuation results to June 30, 2045 commencing with Fiscal Year 2018.

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 2018 through 2045 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 are based on the June 30, 2013, accumulated member contributions of \$70,783,523, rolled forward 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 2045**

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

<b>Year Ended June 30</b>	<b>Actuarial Accrued Liability</b>	<b>Actuarial Value of Assets</b>	<b>Unfunded Actuarial Accrued Liability</b>	<b>Tier I Funded Ratio</b>	<b>Tier II Funded Ratio</b>	<b>Total Funded Ratio</b>
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	126,777,546,242	51,615,935,913	(75,161,610,329)	40.4%	142.8%	40.7%
2019	130,655,717,529	53,303,456,993	(77,352,260,536)	40.4%	139.6%	40.8%
2020	134,532,161,757	55,555,477,487	(78,976,684,271)	40.8%	137.7%	41.3%

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

**TABLE 1 (continued)**

**Projections – Projection of Funded Ratio to 2045**

<b>Year Ended June 30</b>	<b>Actuarial Accrued Liability</b>	<b>Actuarial Value of Assets</b>	<b>Unfunded Actuarial Accrued Liability</b>	<b>Tier I Funded Ratio</b>	<b>Tier II Funded Ratio</b>	<b>Total Funded Ratio</b>
2021	\$138,402,063,473	\$58,701,652,819	(\$79,700,410,654)	41.8%	137.9%	42.4%
2022	142,254,319,930	61,540,270,570	(80,714,049,360)	42.5%	137.4%	43.3%
2023	146,084,705,275	64,421,244,155	(81,663,461,121)	43.2%	136.8%	44.1%
2024	149,887,892,652	67,369,004,853	(82,518,887,799)	43.8%	136.2%	44.9%
2025	153,652,815,974	70,389,675,006	(83,263,140,968)	44.5%	135.5%	45.8%
2026	157,364,985,627	73,503,513,164	(83,861,472,464)	45.2%	135.0%	46.7%
2027	161,000,249,566	76,707,937,774	(84,292,311,792)	45.8%	134.4%	47.6%
2028	164,547,095,797	79,997,621,388	(84,549,474,409)	46.6%	133.9%	48.6%
2029	167,992,152,625	83,382,773,362	(84,609,379,262)	47.3%	133.5%	49.6%
2030	171,319,889,931	86,859,376,915	(84,460,513,016)	48.0%	133.1%	50.7%
2031	174,510,645,466	90,436,591,221	(84,074,054,245)	48.8%	132.7%	51.8%
2032	177,549,586,625	94,144,115,857	(83,405,470,768)	49.6%	132.3%	53.0%
2033	180,416,408,062	98,008,036,991	(82,408,371,071)	50.5%	132.0%	54.3%
2034	183,100,947,297	102,695,114,168	(80,405,833,129)	51.9%	131.7%	56.1%
2035	185,589,748,887	107,620,176,377	(77,969,572,510)	53.3%	131.4%	58.0%
2036	187,881,684,634	112,820,493,139	(75,061,191,495)	54.9%	131.1%	60.0%
2037	189,975,240,960	118,337,656,601	(71,637,584,359)	56.7%	130.8%	62.3%
2038	191,871,503,836	124,219,322,393	(67,652,181,443)	58.7%	130.6%	64.7%
2039	193,554,179,519	130,496,145,702	(63,058,033,817)	60.9%	130.4%	67.4%
2040	195,024,496,525	137,219,118,868	(57,805,377,656)	63.4%	130.1%	70.4%
2041	196,298,970,350	144,450,577,355	(51,848,392,995)	66.2%	129.9%	73.6%
2042	197,402,777,785	152,263,347,986	(45,139,429,799)	69.4%	129.7%	77.1%
2043	198,364,204,599	160,738,661,089	(37,625,543,510)	73.0%	129.5%	81.0%
2044	199,231,798,242	169,972,905,522	(29,258,892,720)	77.1%	129.3%	85.3%
2045	200,063,952,287	180,057,557,058	(20,006,395,229)	81.9%	129.1%	90.0%

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

**TABLE 2**  
**Projections – Projection of Contributions to Trust to 2045 (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	Contributions						
		School District				Federal Funds	State	Total
		§16-158(e) (2.2 Formula)	§16-158(f) (6% FAS Cap)	§16-158(i-5) (Salaries above Gov.'s)	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	4,465,578,109	5,513,334,858
2020	986,594,427	63,580,530	4,320,400	2,821,876	70,722,806	20,630,786	4,790,520,394	5,868,468,412

\* 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 2045 (Dollars)**

Year Ended June 30	Member	Contributions				Federal Funds	State	Total
		School District			Total *			
		§16-158(e) (2.2 Formula)	§16-158(f) (6% FAS Cap)	§16-158(i-5) (Salaries above Gov.'s)				
2021	\$1,015,498,443	\$65,443,233	\$4,338,880	3,215,386	\$72,997,499	\$20,219,702	\$5,061,592,462	\$6,170,308,107
2022	1,045,028,662	67,346,292	4,570,720	3,561,858	75,478,869	19,785,876	5,302,755,174	6,443,048,581
2023	1,074,011,637	69,214,083	4,574,640	3,871,070	77,659,793	19,356,076	5,409,753,211	6,580,780,717
2024	1,103,559,006	71,118,247	4,564,560	4,149,639	79,832,446	18,858,597	5,538,972,123	6,741,222,172
2025	1,133,995,628	73,079,718	4,691,680	4,397,099	82,168,497	18,320,329	5,675,707,521	6,910,191,976
2026	1,165,358,615	75,100,888	4,844,000	4,604,445	84,549,333	17,713,451	5,834,652,959	7,102,274,358
2027	1,197,485,244	77,171,271	5,152,560	4,764,157	87,087,988	17,004,290	5,999,399,741	7,300,977,264
2028	1,230,481,847	79,297,719	5,163,200	4,882,518	89,343,437	16,215,016	6,155,714,118	7,491,754,418
2029	1,264,517,189	81,491,108	5,263,440	4,945,233	91,699,780	15,370,909	6,320,046,338	7,691,634,216
2030	1,299,872,992	83,769,593	5,482,960	4,950,429	94,202,982	14,471,919	6,479,147,207	7,887,695,100
2031	1,336,511,245	86,130,725	5,672,800	4,891,598	96,695,123	13,513,614	6,648,362,151	8,095,082,132
2032	1,374,308,615	88,566,555	5,797,120	4,770,208	99,133,883	12,460,398	6,841,845,055	8,327,747,951
2033	1,413,106,255	91,066,848	6,010,480	4,582,027	101,659,354	11,367,655	7,057,914,418	8,584,047,682
2034	1,452,752,703	93,621,841	5,925,920	4,331,614	103,879,375	10,233,836	7,903,968,538	9,470,834,452
2035	1,493,699,103	96,260,609	5,973,520	4,020,732	106,254,861	9,061,775	8,128,205,468	9,737,221,206
2036	1,536,037,389	98,989,076	5,861,520	3,657,441	108,508,037	7,919,126	8,359,995,609	10,012,460,162
2037	1,580,083,297	101,827,590	5,849,200	3,240,487	110,917,277	6,741,689	8,601,123,197	10,298,865,460
2038	1,625,162,863	104,732,718	6,028,960	2,733,946	113,495,624	5,453,324	8,847,992,796	10,592,104,607
2039	1,670,797,837	107,673,638	5,978,000	2,131,863	115,783,502	4,121,301	9,097,931,771	10,888,634,411
2040	1,717,162,201	110,661,564	5,992,560	1,447,783	118,101,907	2,709,300	9,351,924,241	11,189,897,649
2041	1,763,470,453	113,645,874	5,685,120	707,983	120,038,977	1,293,212	9,605,615,118	11,490,417,760
2042	1,810,156,476	116,654,528	5,349,680	-	122,004,208	-	9,861,241,110	11,793,401,794
2043	1,857,673,366	119,716,728	5,037,760	-	124,754,488	-	10,120,100,225	12,102,528,079
2044	1,905,391,521	122,791,898	4,447,520	-	127,239,418	-	10,380,055,784	12,412,686,723
2045	1,951,396,888	125,756,688	3,844,960	-	129,601,648	-	10,630,680,531	12,711,679,068

\* 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**

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**TABLE 2 (continued)**

**Projections – Projection of Contributions to Trust to 2045 (Dollars)**

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**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 - 2018 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%, and 2.00% respectively, of total payrolls for those years. For 2019, the estimate is 2.00% of payroll. All payrolls are assumed to increase at the same rate for years subsequent to 2019.
- 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 - 2019 are based on the June 30, 1993 - June 30, 2017 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. Items subsequent to 2018 are based on the June 30, 2017 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).

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

**TABLE 3**  
**Projections – Projection of Contributions to Trust to 2045 (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	Contributions							
		Member	School District			Federal Funds	State	Total	
			§16-158(e) (2.2 Formula)	§16-158(f) (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%	41.93%	51.77%
2020	10,962,160,296	9.00%	0.58%	0.04%	0.03%	0.65%	0.19%	43.70%	53.53%

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 2045 (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) (6% FAS Cap)	§16-158(i-5) (Payroll above Gov.)	Total			
2021	\$11,283,316,035	9.00%	0.58%	0.04%	0.03%	0.65%	0.18%	44.86%	54.69%
2022	11,611,429,579	9.00%	0.58%	0.04%	0.03%	0.65%	0.17%	45.67%	55.49%
2023	11,933,462,629	9.00%	0.58%	0.04%	0.03%	0.65%	0.16%	45.33%	55.15%
2024	12,261,766,729	9.00%	0.58%	0.04%	0.03%	0.65%	0.15%	45.17%	54.98%
2025	12,599,951,423	9.00%	0.58%	0.04%	0.03%	0.65%	0.15%	45.05%	54.84%
2026	12,948,429,050	9.00%	0.58%	0.04%	0.04%	0.65%	0.14%	45.06%	54.85%
2027	13,305,391,598	9.00%	0.58%	0.04%	0.04%	0.65%	0.13%	45.09%	54.87%
2028	13,672,020,521	9.00%	0.58%	0.04%	0.04%	0.65%	0.12%	45.02%	54.80%
2029	14,050,190,988	9.00%	0.58%	0.04%	0.04%	0.65%	0.11%	44.98%	54.74%
2030	14,443,033,239	9.00%	0.58%	0.04%	0.03%	0.65%	0.10%	44.86%	54.61%
2031	14,850,124,942	9.00%	0.58%	0.04%	0.03%	0.65%	0.09%	44.77%	54.51%
2032	15,270,095,727	9.00%	0.58%	0.04%	0.03%	0.65%	0.08%	44.81%	54.54%
2033	15,701,180,610	9.00%	0.58%	0.04%	0.03%	0.65%	0.07%	44.95%	54.67%
2034	16,141,696,705	9.00%	0.58%	0.04%	0.03%	0.64%	0.06%	48.97%	58.67%
2035	16,596,656,698	9.00%	0.58%	0.04%	0.02%	0.64%	0.05%	48.97%	58.67%
2036	17,067,082,105	9.00%	0.58%	0.03%	0.02%	0.64%	0.05%	48.98%	58.67%
2037	17,556,481,083	9.00%	0.58%	0.03%	0.02%	0.63%	0.04%	48.99%	58.66%
2038	18,057,365,142	9.00%	0.58%	0.03%	0.02%	0.63%	0.03%	49.00%	58.66%
2039	18,564,420,411	9.00%	0.58%	0.03%	0.01%	0.62%	0.02%	49.01%	58.65%
2040	19,079,580,011	9.00%	0.58%	0.03%	0.01%	0.62%	0.01%	49.02%	58.65%
2041	19,594,116,148	9.00%	0.58%	0.03%	0.00%	0.61%	0.01%	49.02%	58.64%
2042	20,112,849,736	9.00%	0.58%	0.03%	0.00%	0.61%	0.00%	49.03%	58.64%
2043	20,640,815,175	9.00%	0.58%	0.02%	0.00%	0.60%	0.00%	49.03%	58.63%
2044	21,171,016,904	9.00%	0.58%	0.02%	0.00%	0.60%	0.00%	49.03%	58.63%
2045	21,682,187,642	9.00%	0.58%	0.02%	0.00%	0.60%	0.00%	49.03%	58.63%

**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 2045**

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	42.77%	9.85%	32.92%	4,554,862,299	1,049,301,284	3,505,561,015
2020	25	44.53%	9.41%	35.13%	4,881,873,986	1,031,023,385	3,850,850,601



**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 2045**

Year Ended June 30	Amortization Year	Employer Rate			Amount of Employer Contribution		
		Total	Normal Cost	Amortization	Total	Normal Cost	Amortization
2021	26	45.69%	8.96%	36.72%	\$5,154,809,664	\$1,011,519,687	\$4,143,289,977
2022	27	46.49%	8.52%	37.97%	5,398,019,919	989,307,133	4,408,712,786
2023	28	46.15%	8.11%	38.04%	5,506,769,080	967,453,201	4,539,315,879
2024	29	45.98%	7.69%	38.28%	5,637,663,167	943,334,260	4,694,328,907
2025	30	45.84%	7.27%	38.57%	5,776,196,348	916,601,715	4,859,594,633
2026	31	45.85%	6.84%	39.01%	5,936,915,743	885,997,862	5,050,917,881
2027	32	45.87%	6.39%	39.48%	6,103,492,020	850,273,926	5,253,218,094
2028	33	45.80%	5.93%	39.86%	6,261,272,571	811,103,857	5,450,168,714
2029	34	45.74%	5.47%	40.27%	6,427,117,028	768,958,070	5,658,158,957
2030	35	45.61%	5.01%	40.60%	6,587,822,109	723,888,140	5,863,933,969
2031	36	45.51%	4.55%	40.97%	6,758,570,888	675,132,113	6,083,438,774
2032	37	45.54%	4.08%	41.45%	6,953,439,336	623,536,594	6,329,902,742
2033	38	45.67%	3.62%	42.05%	7,170,941,427	568,830,450	6,602,110,977
2034	39	49.67%	3.17%	46.50%	8,018,081,749	511,948,538	7,506,133,211
2035	40	49.67%	2.73%	46.94%	8,243,522,103	453,749,442	7,789,772,661
2036	41	49.67%	2.32%	47.35%	8,476,422,772	395,246,516	8,081,176,257
2037	42	49.66%	1.92%	47.74%	8,718,782,163	336,486,717	8,382,295,446
2038	43	49.66%	1.51%	48.14%	8,966,941,744	273,374,652	8,693,567,092
2039	44	49.65%	1.11%	48.55%	9,217,836,574	205,627,717	9,012,208,857
2040	45	49.65%	0.71%	48.94%	9,472,735,448	134,972,460	9,337,762,988
2041	46	49.64%	0.33%	49.32%	9,726,947,307	63,895,954	9,663,051,352
2042	47	49.64%	-0.02%	49.65%	9,983,245,318	(3,492,696)	9,986,738,014
2043	48	49.63%	-0.32%	49.95%	10,244,854,713	(65,859,011)	10,310,713,724
2044	49	49.63%	-0.56%	50.19%	10,507,295,202	(119,167,989)	10,626,463,190
2045	50	49.63%	-0.72%	50.35%	10,760,282,180	(156,202,354)	10,916,484,534

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

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**TABLE 4 (continued)**

**Projections – Projection of Employer Normal Cost and Amortization Amount to 2045**

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**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 2019 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 - 2019 are based on the June 30, 1993 - June 30, 2017 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. Items subsequent to 2018 are based on the June 30, 2017 valuation.

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

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### 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 2045 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.

<b>Year Ended June 30</b>	<b>Contributions</b>	<b>Benefits and Expenses</b>	<b>Market Value Asset Return</b>	<b>Actuarial Value of Assets *</b>	<b>Market Value of Assets</b>	<b>Actuarial Accrued Liability</b>	<b>Unfunded Actuarial Accrued Liability</b>	<b>AVA Funded Ratio</b>
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	5,122,759,135	6,564,787,604	3,405,825,520	51,615,935,913	51,339,461,569	126,777,546,242	75,161,610,329	40.7%
2019	5,513,334,858	6,832,810,696	3,547,580,656	53,303,456,993	53,567,566,387	130,655,717,529	77,352,260,536	40.8%
2020	5,868,468,412	7,106,604,764	3,706,394,875	55,555,477,487	56,035,824,909	134,532,161,757	78,976,684,271	41.3%

**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.

\* 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 2045 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 Accrued Liability	AVA Funded Ratio
2021	\$6,170,308,107	\$7,384,491,522	\$3,880,011,324	\$58,701,652,819	\$58,701,652,819	\$138,402,063,473	\$79,700,410,654	42.4%
2022	6,443,048,581	7,670,582,829	4,066,151,999	61,540,270,570	61,540,270,570	142,254,319,930	80,714,049,360	43.3%
2023	6,580,780,717	7,959,375,263	4,259,568,131	64,421,244,155	64,421,244,155	146,084,705,275	81,663,461,121	44.1%
2024	6,741,222,172	8,250,136,562	4,456,675,087	67,369,004,853	67,369,004,853	149,887,892,652	82,518,887,799	44.9%
2025	6,910,191,976	8,548,027,905	4,658,506,082	70,389,675,006	70,389,675,006	153,652,815,974	83,263,140,968	45.8%
2026	7,102,274,358	8,854,389,423	4,865,953,223	73,503,513,164	73,503,513,164	157,364,985,627	83,861,472,464	46.7%
2027	7,300,977,264	9,176,166,937	5,079,614,283	76,707,937,774	76,707,937,774	161,000,249,566	84,292,311,792	47.6%
2028	7,491,754,418	9,501,292,611	5,299,221,807	79,997,621,388	79,997,621,388	164,547,095,797	84,549,474,409	48.6%
2029	7,691,634,216	9,831,423,127	5,524,940,885	83,382,773,362	83,382,773,362	167,992,152,625	84,609,379,262	49.6%
2030	7,887,695,100	10,168,072,475	5,756,980,927	86,859,376,915	86,859,376,915	171,319,889,931	84,460,513,016	50.7%
2031	8,095,082,132	10,513,383,657	5,995,515,831	90,436,591,221	90,436,591,221	174,510,645,466	84,074,054,245	51.8%
2032	8,327,747,951	10,862,082,976	6,241,859,660	94,144,115,857	94,144,115,857	177,549,586,625	83,405,470,768	53.0%
2033	8,584,047,682	11,218,025,436	6,497,898,889	98,008,036,991	98,008,036,991	180,416,408,062	82,408,371,071	54.3%
2034	9,470,834,452	11,570,820,357	6,787,063,083	102,695,114,168	102,695,114,168	183,100,947,297	80,405,833,129	56.1%
2035	9,737,221,206	11,924,270,272	7,112,111,274	107,620,176,377	107,620,176,377	185,589,748,887	77,969,572,510	58.0%
2036	10,012,460,162	12,266,658,794	7,454,515,394	112,820,493,139	112,820,493,139	187,881,684,634	75,061,191,495	60.0%
2037	10,298,865,460	12,598,644,260	7,816,942,262	118,337,656,601	118,337,656,601	189,975,240,960	71,637,584,359	62.3%
2038	10,592,104,607	12,912,848,733	8,202,409,918	124,219,322,393	124,219,322,393	191,871,503,836	67,652,181,443	64.7%
2039	10,888,634,411	13,225,377,656	8,613,566,554	130,496,145,702	130,496,145,702	193,554,179,519	63,058,033,817	67.4%
2040	11,189,897,649	13,520,097,680	9,053,173,198	137,219,118,868	137,219,118,868	195,024,496,525	57,805,377,656	70.4%
2041	11,490,417,760	13,784,021,464	9,525,062,191	144,450,577,355	144,450,577,355	196,298,970,350	51,848,392,995	73.6%
2042	11,793,401,794	14,014,435,403	10,033,804,239	152,263,347,986	152,263,347,986	197,402,777,785	45,139,429,799	77.1%
2043	12,102,528,079	14,211,823,978	10,584,609,003	160,738,661,089	160,738,661,089	198,364,204,599	37,625,543,510	81.0%
2044	12,412,686,723	14,361,925,219	11,183,482,929	169,972,905,522	169,972,905,522	199,231,798,242	29,258,892,720	85.3%
2045	12,711,679,068	14,463,806,459	11,836,778,928	180,057,557,058	180,057,557,058	200,063,952,287	20,006,395,229	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.

\* 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 2045 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	4,981,775,468	6,538,706,645	3,375,065,434	51,085,453,204	50,811,820,325	126,406,034,083	75,320,580,878	40.4%
2019	5,329,097,773	6,800,035,760	3,505,344,593	52,585,674,028	52,846,226,932	130,141,544,460	77,555,870,431	40.4%
2020	5,640,582,240	7,064,683,355	3,649,392,346	54,599,436,922	55,071,518,163	133,837,933,465	79,238,496,543	40.8%
2021	5,898,170,532	7,331,452,309	3,804,841,409	57,443,077,796	57,443,077,796	137,489,278,048	80,046,200,252	41.8%
2022	6,126,071,917	7,601,517,521	3,969,374,850	59,937,007,042	59,937,007,042	141,087,460,894	81,150,453,852	42.5%
2023	6,218,886,855	7,882,636,070	4,137,359,270	62,410,617,098	62,410,617,098	144,614,960,724	82,204,343,626	43.2%
2024	6,332,557,485	8,164,974,826	4,304,608,590	64,882,808,347	64,882,808,347	148,062,102,294	83,179,293,947	43.8%
2025	6,452,383,655	8,453,728,386	4,471,749,519	67,353,213,135	67,353,213,135	151,412,681,282	84,059,468,147	44.5%
2026	6,592,722,490	8,749,828,467	4,639,226,210	69,835,333,368	69,835,333,368	154,647,019,161	84,811,685,793	45.2%
2027	6,736,554,901	9,058,574,316	4,807,202,656	72,320,516,609	72,320,516,609	157,736,701,127	85,416,184,517	45.8%
2028	6,868,774,021	9,372,698,705	4,974,798,799	74,791,390,724	74,791,390,724	160,660,318,748	85,868,928,024	46.6%
2029	7,007,792,444	9,691,158,293	5,141,479,546	77,249,504,421	77,249,504,421	163,397,462,817	86,147,958,395	47.3%
2030	7,140,371,668	10,015,179,992	5,306,847,018	79,681,543,116	79,681,543,116	165,925,198,081	86,243,654,965	48.0%
2031	7,281,280,815	10,346,388,542	5,470,429,248	82,086,864,637	82,086,864,637	168,216,656,170	86,129,791,533	48.8%
2032	7,444,627,115	10,680,041,306	5,632,841,028	84,484,291,474	84,484,291,474	170,248,158,509	85,763,867,035	49.6%
2033	7,628,715,221	11,019,183,700	5,795,234,006	86,889,057,001	86,889,057,001	171,990,775,577	85,101,718,577	50.5%
2034	8,440,454,607	11,353,562,588	5,980,275,211	89,956,224,231	89,956,224,231	173,424,917,694	83,468,693,463	51.9%
2035	8,629,558,869	11,686,740,203	6,189,934,349	93,088,977,246	93,088,977,246	174,527,605,817	81,438,628,571	53.3%
2036	8,825,437,312	12,006,121,735	6,404,904,452	96,313,197,275	96,313,197,275	175,289,094,932	78,975,897,657	54.9%
2037	9,031,159,822	12,313,787,844	6,627,031,829	99,657,601,082	99,657,601,082	175,696,666,808	76,039,065,726	56.7%
2038	9,242,091,002	12,598,337,135	6,858,563,461	103,159,918,410	103,159,918,410	175,744,226,951	72,584,308,541	58.7%
2039	9,454,631,492	12,877,758,448	7,101,384,845	106,838,176,300	106,838,176,300	175,405,656,617	68,567,480,317	60.9%
2040	9,671,422,782	13,136,078,071	7,357,409,406	110,730,930,417	110,730,930,417	174,671,771,404	63,940,840,987	63.4%
2041	9,888,346,351	13,359,321,832	7,629,680,987	114,889,635,923	114,889,635,923	173,549,763,356	58,660,127,433	66.2%
2042	10,109,708,064	13,546,967,550	7,921,970,433	119,374,346,869	119,374,346,869	172,052,386,970	52,678,040,102	69.4%
2043	10,339,708,186	13,691,959,744	8,238,875,476	124,260,970,787	124,260,970,787	170,204,301,307	45,943,330,520	73.0%
2044	10,574,288,103	13,783,934,439	8,585,930,333	129,637,254,784	129,637,254,784	168,046,740,351	38,409,485,567	77.1%
2045	10,804,336,007	13,820,839,679	8,969,030,206	135,589,781,318	135,589,781,318	165,632,051,135	30,042,269,817	81.9%

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 2045 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	140,983,667	26,080,959	30,760,086	530,482,708	527,641,244	371,512,159	(158,970,549)	142.8%
2019	184,237,084	32,774,935	42,236,062	717,782,965	721,339,455	514,173,070	(203,609,895)	139.6%
2020	227,886,172	41,921,409	57,002,529	956,040,565	964,306,746	694,228,293	(261,812,273)	137.7%
2021	272,137,575	53,039,213	75,169,915	1,258,575,023	1,258,575,023	912,785,425	(345,789,598)	137.9%
2022	316,976,664	69,065,308	96,777,149	1,603,263,527	1,603,263,527	1,166,859,036	(436,404,492)	137.4%
2023	361,893,861	76,739,193	122,208,860	2,010,627,056	2,010,627,056	1,469,744,551	(540,882,505)	136.8%
2024	408,664,687	85,161,735	152,066,497	2,486,196,506	2,486,196,506	1,825,790,357	(660,406,148)	136.2%
2025	457,808,321	94,299,519	186,756,563	3,036,461,871	3,036,461,871	2,240,134,692	(796,327,179)	135.5%
2026	509,551,867	104,560,956	226,727,013	3,668,179,796	3,668,179,796	2,717,966,466	(950,213,329)	135.0%
2027	564,422,363	117,592,621	272,411,627	4,387,421,165	4,387,421,165	3,263,548,439	(1,123,872,726)	134.4%
2028	622,980,396	128,593,906	324,423,009	5,206,230,664	5,206,230,664	3,886,777,049	(1,319,453,615)	133.9%
2029	683,841,772	140,264,834	383,461,339	6,133,268,941	6,133,268,941	4,594,689,808	(1,538,579,133)	133.5%
2030	747,323,432	152,892,483	450,133,909	7,177,833,799	7,177,833,799	5,394,691,849	(1,783,141,949)	133.1%
2031	813,801,318	166,995,115	525,086,583	8,349,726,585	8,349,726,585	6,293,989,296	(2,055,737,288)	132.7%
2032	883,120,837	182,041,670	609,018,632	9,659,824,383	9,659,824,383	7,301,428,116	(2,358,396,267)	132.3%
2033	955,332,461	198,841,737	702,664,882	11,118,979,990	11,118,979,990	8,425,632,484	(2,693,347,506)	132.0%
2034	1,030,379,845	217,257,770	806,787,872	12,738,889,937	12,738,889,937	9,676,029,603	(3,062,860,334)	131.7%
2035	1,107,662,337	237,530,069	922,176,925	14,531,199,131	14,531,199,131	11,062,143,070	(3,469,056,061)	131.4%
2036	1,187,022,850	260,537,059	1,049,610,942	16,507,295,863	16,507,295,863	12,592,589,702	(3,914,706,162)	131.1%
2037	1,267,705,639	284,856,417	1,189,910,433	18,680,055,519	18,680,055,519	14,278,574,152	(4,401,481,367)	130.8%
2038	1,350,013,605	314,511,598	1,343,846,457	21,059,403,983	21,059,403,983	16,127,276,885	(4,932,127,097)	130.6%
2039	1,434,002,919	347,619,209	1,512,181,709	23,657,969,401	23,657,969,401	18,148,522,902	(5,509,446,499)	130.4%
2040	1,518,474,867	384,019,609	1,695,763,792	26,488,188,451	26,488,188,451	20,352,725,121	(6,135,463,331)	130.1%
2041	1,602,071,409	424,699,632	1,895,381,204	29,560,941,432	29,560,941,432	22,749,206,994	(6,811,734,439)	129.9%
2042	1,683,693,731	467,467,852	2,111,833,806	32,889,001,117	32,889,001,117	25,350,390,814	(7,538,610,302)	129.7%
2043	1,762,819,893	519,864,234	2,345,733,526	36,477,690,302	36,477,690,302	28,159,903,292	(8,317,787,010)	129.5%
2044	1,838,398,620	577,990,780	2,597,552,596	40,335,650,738	40,335,650,738	31,185,057,891	(9,150,592,846)	129.3%
2045	1,907,343,061	642,966,780	2,867,748,721	44,467,775,740	44,467,775,740	34,431,901,151	(10,035,874,588)	129.1%

**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 2045 by Member Group**

<b>Year Ended June 30</b>	<b>Tier I Current Active</b>	<b>Tier II Current Active</b>	<b>New Entrants</b>	<b>Inactive</b>	<b>Total Actuarial Accrued Liability</b>
2017	\$38,353,799,238	\$265,753,359	-	\$84,284,481,671	\$122,904,034,268
2018	42,674,167,035	334,939,266	\$36,572,893	83,731,867,047	126,777,546,242
2019	47,106,866,809	406,663,316	107,509,753	83,034,677,651	130,655,717,529
2020	51,651,980,005	483,851,023	210,377,270	82,185,953,460	134,532,161,757
2021	56,309,597,899	569,849,639	342,935,785	81,179,680,149	138,402,063,473
2022	61,075,993,744	664,037,818	502,821,217	80,011,467,150	142,254,319,930
2023	65,940,095,894	767,224,938	702,519,613	78,674,864,830	146,084,705,275
2024	70,888,594,921	880,800,190	944,990,168	77,173,507,373	149,887,892,652
2025	75,906,949,675	1,006,278,080	1,233,856,612	75,505,731,608	153,652,815,974
2026	80,973,383,999	1,144,915,876	1,573,050,591	73,673,635,163	157,364,985,627
2027	86,056,447,840	1,296,222,376	1,967,326,063	71,680,253,286	161,000,249,566
2028	91,129,015,541	1,460,907,352	2,425,869,696	69,531,303,208	164,547,095,797
2029	96,164,525,303	1,639,916,163	2,954,773,645	67,232,937,513	167,992,152,625
2030	101,132,225,946	1,834,247,429	3,560,444,420	64,792,972,136	171,319,889,931
2031	105,994,387,075	2,044,864,609	4,249,124,687	62,222,269,095	174,510,645,466
2032	110,714,145,867	2,272,606,336	5,028,821,780	59,534,012,642	177,549,586,625
2033	115,249,234,266	2,518,211,988	5,907,420,497	56,741,541,311	180,416,408,062
2034	119,558,540,791	2,782,604,935	6,893,424,668	53,866,376,903	183,100,947,297
2035	123,600,657,681	3,066,562,709	7,995,580,361	50,926,948,136	185,589,748,887
2036	127,341,302,703	3,370,893,878	9,221,695,823	47,947,792,229	187,881,684,634
2037	130,744,299,300	3,696,409,567	10,582,164,585	44,952,367,508	189,975,240,960
2038	133,759,695,413	4,043,739,166	12,083,537,719	41,984,531,539	191,871,503,836
2039	136,354,211,363	4,413,573,067	13,734,949,835	39,051,445,254	193,554,179,519
2040	138,491,480,853	4,806,506,648	15,546,218,473	36,180,290,552	195,024,496,525
2041	140,150,656,222	5,222,742,727	17,526,464,266	33,399,107,134	196,298,970,350
2042	141,325,425,878	5,663,193,620	19,687,197,194	30,726,961,093	197,402,777,785
2043	142,025,734,979	6,127,238,239	22,032,665,052	28,178,566,328	198,364,204,599
2044	142,285,505,870	6,613,959,293	24,571,098,599	25,761,234,481	199,231,798,242
2045	142,136,491,046	7,120,008,597	27,311,892,555	23,495,560,089	200,063,952,287



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

**TABLE 7**

**Projections – Projection of Total Normal Cost to 2045 by Member Group**

<b>Year Ended June 30</b>	<b>Tier I Current Active</b>	<b>Tier II Current Active</b>	<b>New Entrants</b>	<b>Total Normal Cost</b>
2017	\$1,887,007,720	\$72,768,009	-	\$1,959,775,729
2018	1,864,274,606	71,000,940	\$35,390,106	1,970,665,651
2019	1,839,917,191	69,881,231	70,479,084	1,980,277,506
2020	1,814,539,563	69,743,721	105,031,440	1,989,314,724
2021	1,788,200,173	70,901,146	138,784,535	1,997,885,854
2022	1,760,357,883	72,633,125	171,365,359	2,004,356,366
2023	1,730,250,988	74,513,529	205,889,438	2,010,653,955
2024	1,696,829,928	76,534,623	241,870,186	2,015,234,738
2025	1,659,640,429	78,757,701	279,667,530	2,018,065,660
2026	1,617,357,371	81,105,481	319,462,210	2,017,925,063
2027	1,568,187,803	83,521,402	361,696,913	2,013,406,118
2028	1,513,570,394	86,257,897	406,457,767	2,006,286,057
2029	1,454,832,110	89,172,335	453,194,773	1,997,199,218
2030	1,392,140,783	92,280,931	502,049,101	1,986,470,815
2031	1,324,883,382	95,543,908	552,874,685	1,973,301,975
2032	1,253,215,670	98,910,585	606,293,253	1,958,419,509
2033	1,176,716,656	102,358,098	662,323,237	1,941,397,991
2034	1,096,117,353	105,882,864	721,024,946	1,923,025,163
2035	1,013,001,795	109,492,337	782,103,677	1,904,597,810
2036	929,110,658	113,192,551	844,915,374	1,887,218,584
2037	844,280,081	116,924,813	910,036,225	1,871,241,119
2038	754,391,906	120,601,040	976,922,446	1,851,915,392
2039	658,514,321	124,197,850	1,045,782,099	1,828,494,271
2040	558,764,828	127,696,173	1,116,412,292	1,802,873,293
2041	457,599,456	130,989,583	1,188,187,524	1,776,776,564
2042	359,344,935	134,106,240	1,261,283,448	1,754,734,623
2043	267,561,255	136,813,743	1,334,147,052	1,738,522,050
2044	186,223,547	138,752,773	1,406,585,986	1,731,562,305
2045	121,201,396	139,618,302	1,478,393,822	1,739,213,520

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 2045 by Member Group**

<b>Year Ended June 30</b>	<b>Tier I Current Active</b>	<b>Tier II Current Active</b>	<b>New Entrants</b>	<b>Inactives</b>	<b>Total Benefit Payments</b>	<b>Administrative Expenses</b>	<b>Total Benefits and Expenses</b>
2017	\$127,820,514	\$19,550,629	-	\$6,105,474,366	\$6,252,845,509	\$22,728,735	\$6,275,574,244
2018	281,851,070	22,047,117	\$13,507	6,234,326,898	6,538,238,592	26,549,011	6,564,787,603
2019	441,186,987	23,155,617	4,333,987	6,336,637,768	6,805,314,359	27,496,337	6,832,810,695
2020	607,022,498	22,590,271	12,793,617	6,435,895,292	7,078,301,678	28,303,087	7,106,604,765
2021	779,411,997	20,453,840	24,778,382	6,530,715,027	7,355,359,246	29,132,276	7,384,491,522
2022	961,510,049	20,087,549	39,884,440	6,619,121,362	7,640,603,400	29,979,429	7,670,582,829
2023	1,159,400,293	19,641,389	46,715,915	6,702,806,783	7,928,564,380	30,810,883	7,959,375,262
2024	1,373,447,667	18,602,169	54,835,932	6,771,592,266	8,218,478,034	31,658,528	8,250,136,561
2025	1,603,488,335	17,003,988	64,162,081	6,830,841,818	8,515,496,222	32,531,683	8,548,027,905
2026	1,854,205,574	15,120,627	74,822,477	6,876,809,331	8,820,958,009	33,431,414	8,854,389,423
2027	2,131,682,461	14,669,960	86,730,703	6,908,730,761	9,141,813,885	34,353,052	9,176,166,936
2028	2,431,050,804	14,710,551	96,011,504	6,924,220,104	9,465,992,963	35,299,647	9,501,292,610
2029	2,751,256,673	14,920,317	105,726,696	6,923,243,400	9,795,147,086	36,276,041	9,831,423,127
2030	3,094,718,972	15,327,930	116,125,591	6,904,609,665	10,130,782,158	37,290,317	10,168,072,475
2031	3,465,488,781	15,995,171	127,653,887	6,865,904,435	10,475,042,274	38,341,383	10,513,383,656
2032	3,860,331,639	17,057,182	139,649,816	6,805,618,639	10,822,657,276	39,425,701	10,862,082,977
2033	4,281,556,346	18,643,744	152,791,738	6,724,494,894	11,177,486,722	40,538,714	11,218,025,436
2034	4,725,916,906	20,623,513	167,075,068	6,615,528,791	11,529,144,278	41,676,078	11,570,820,356
2035	5,192,501,314	23,207,293	182,546,533	6,483,164,397	11,881,419,537	42,850,735	11,924,270,271
2036	5,673,363,164	26,423,709	200,060,440	6,322,746,160	12,222,593,473	44,065,321	12,266,658,794
2037	6,167,850,442	30,266,353	218,222,553	6,136,976,017	12,553,315,365	45,328,895	12,598,644,260
2038	6,682,712,640	34,877,688	240,905,176	5,907,731,106	12,866,226,610	46,622,123	12,912,848,733
2039	7,197,532,029	40,217,988	266,263,030	5,673,433,325	13,177,446,372	47,931,283	13,225,377,655
2040	7,715,155,133	46,406,701	294,051,415	5,415,223,063	13,470,836,312	49,261,368	13,520,097,680
2041	8,220,581,762	53,757,071	324,982,878	5,134,109,909	13,733,431,620	50,589,844	13,784,021,464
2042	8,702,679,204	61,625,441	357,541,175	4,840,660,427	13,962,506,247	51,929,157	14,014,435,404
2043	9,148,869,498	71,322,926	397,970,127	4,540,369,122	14,158,531,673	53,292,305	14,211,823,978
2044	9,540,629,487	82,734,801	442,516,621	4,241,383,082	14,307,263,991	54,661,228	14,361,925,219
2045	9,888,212,781	97,843,034	490,406,533	3,931,363,097	14,407,825,445	55,981,014	14,463,806,459

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

**TABLE 9**  
**Projections – Projection of Payroll to 2045 by Member Group**

<b>Year Ended June 30</b>	<b>Tier I Current Active</b>	<b>Tier II Current Active</b>	<b>New Entrants</b>	<b>Total Payroll</b>
2017	\$8,967,390,217	\$1,089,442,396	-	\$10,056,832,613
2018	8,778,082,753	1,049,950,983	\$516,534,205	10,344,567,941
2019	8,602,616,386	1,020,512,004	1,026,566,710	10,649,695,100
2020	8,430,091,720	1,002,534,015	1,529,534,561	10,962,160,296
2021	8,259,565,205	997,672,760	2,026,078,070	11,283,316,035
2022	8,089,466,649	1,007,183,692	2,514,779,238	11,611,429,579
2023	7,912,419,725	1,021,683,729	2,999,359,175	11,933,462,629
2024	7,721,047,981	1,035,865,063	3,504,853,685	12,261,766,729
2025	7,513,192,299	1,049,702,580	4,037,056,544	12,599,951,423
2026	7,286,741,634	1,063,624,004	4,598,063,412	12,948,429,050
2027	7,034,032,005	1,076,936,664	5,194,422,929	13,305,391,598
2028	6,750,016,116	1,089,096,119	5,832,908,286	13,672,020,521
2029	6,451,949,075	1,101,692,038	6,496,549,875	14,050,190,988
2030	6,139,439,553	1,113,409,704	7,190,183,982	14,443,033,239
2031	5,807,888,077	1,123,983,480	7,918,253,385	14,850,124,942
2032	5,457,641,988	1,133,036,350	8,679,417,389	15,270,095,727
2033	5,086,375,486	1,140,219,557	9,474,585,567	15,701,180,610
2034	4,693,031,761	1,145,217,183	10,303,447,761	16,141,696,705
2035	4,289,297,394	1,148,341,306	11,159,017,998	16,596,656,698
2036	3,877,939,332	1,149,547,995	12,039,594,778	17,067,082,105
2037	3,470,862,875	1,149,419,726	12,936,198,482	17,556,481,083
2038	3,057,213,976	1,147,858,939	13,852,292,227	18,057,365,142
2039	2,631,054,643	1,144,439,862	14,788,925,906	18,564,420,411
2040	2,207,637,044	1,139,677,116	15,732,265,851	19,079,580,011
2041	1,793,322,712	1,132,574,613	16,668,218,823	19,594,116,148
2042	1,405,141,619	1,122,351,493	17,585,356,624	20,112,849,736
2043	1,053,927,479	1,108,241,134	18,478,646,562	20,640,815,175
2044	744,365,567	1,088,635,170	19,338,016,167	21,171,016,904
2045	489,486,969	1,062,455,814	20,130,244,859	21,682,187,642

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

**TABLE 10**  
**Projections – Projection of Member Count to 2045 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
2017	119,705	247,769	367,474	39,880	10	39,890	159,585	247,779	407,364
2018	112,220	245,189	357,409	47,365	24	47,389	159,585	245,213	404,798
2019	105,479	242,391	347,870	54,106	46	54,152	159,585	242,437	402,022
2020	99,300	239,407	338,707	60,285	78	60,363	159,585	239,485	399,070
2021	93,657	236,162	329,819	65,928	123	66,051	159,585	236,285	395,870
2022	88,413	232,835	321,248	71,172	188	71,360	159,585	233,023	392,608
2023	83,495	229,085	312,580	76,090	356	76,446	159,585	229,441	389,026
2024	78,703	225,107	303,810	80,882	630	81,512	159,585	225,737	385,322
2025	74,009	220,920	294,929	85,576	999	86,575	159,585	221,919	381,504
2026	69,333	216,588	285,921	90,252	1,481	91,733	159,585	218,069	377,654
2027	64,647	212,145	276,792	94,938	2,217	97,155	159,585	214,362	373,947
2028	60,070	207,462	267,532	99,515	3,021	102,536	159,585	210,483	370,068
2029	55,604	202,538	258,142	103,981	3,954	107,935	159,585	206,492	366,077
2030	51,186	197,431	248,617	108,399	5,014	113,413	159,585	202,445	362,030
2031	46,822	192,140	238,962	112,763	6,218	118,981	159,585	198,358	357,943
2032	42,507	186,675	229,182	117,078	7,539	124,617	159,585	194,214	353,799
2033	38,233	181,046	219,279	121,352	8,978	130,330	159,585	190,024	349,609
2034	34,074	175,186	209,260	125,511	10,518	136,029	159,585	185,704	345,289
2035	30,040	169,091	199,131	129,545	12,155	141,700	159,585	181,246	340,831
2036	26,211	162,689	188,900	133,374	13,917	147,291	159,585	176,606	336,191
2037	22,515	156,063	178,578	137,070	15,760	152,830	159,585	171,823	331,408
2038	18,930	155,136	174,066	140,655	17,759	158,414	159,585	172,895	332,480
2039	15,534	153,952	169,486	144,051	19,863	163,914	159,585	173,815	333,400
2040	12,358	152,493	164,851	147,227	22,067	169,294	159,585	174,560	334,145
2041	9,496	150,685	160,181	150,089	24,382	174,471	159,585	175,067	334,652
2042	6,993	148,501	155,494	152,592	26,788	179,380	159,585	175,289	334,874
2043	4,858	145,948	150,806	154,727	29,367	184,094	159,585	175,315	334,900
2044	3,146	142,987	146,133	156,439	32,083	188,522	159,585	175,070	334,655
2045	1,947	139,548	141,495	157,638	34,937	192,575	159,585	174,485	334,070

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

**TABLE 11**  
**Projections – Projection of Employer Normal Cost to 2045 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 (% of pay)	Total (% of pay)
2019	\$8,602,616,386	\$2,047,078,714	\$10,649,695,100	\$1,065,681,716	(\$43,876,769)	\$27,496,337	\$1,049,301,284	12.39%	-2.14%	0.26%	9.85%
2020	8,430,091,720	2,532,068,576	10,962,160,296	1,055,831,308	(53,111,011)	28,303,087	1,031,023,385	12.52%	-2.10%	0.26%	9.41%
2021	8,259,565,205	3,023,750,830	11,283,316,035	1,044,839,305	(62,451,894)	29,132,276	1,011,519,687	12.65%	-2.07%	0.26%	8.96%
2022	8,089,466,649	3,521,962,930	11,611,429,579	1,032,305,884	(72,978,180)	29,979,429	989,307,133	12.76%	-2.07%	0.26%	8.52%
2023	7,912,419,725	4,021,042,904	11,933,462,629	1,018,133,213	(81,490,894)	30,810,883	967,453,201	12.87%	-2.03%	0.26%	8.11%
2024	7,721,047,981	4,540,718,748	12,261,766,729	1,001,935,610	(90,259,878)	31,658,528	943,334,260	12.98%	-1.99%	0.26%	7.69%
2025	7,513,192,299	5,086,759,124	12,599,951,423	983,453,122	(99,383,090)	32,531,683	916,601,715	13.09%	-1.95%	0.26%	7.27%
2026	7,286,741,634	5,661,687,416	12,948,429,050	961,550,624	(108,984,176)	33,431,414	885,997,862	13.20%	-1.92%	0.26%	6.84%
2027	7,034,032,005	6,271,359,593	13,305,391,598	935,124,923	(119,204,049)	34,353,052	850,273,926	13.29%	-1.90%	0.26%	6.39%
2028	6,750,016,116	6,922,004,405	13,672,020,521	906,068,943	(130,264,733)	35,299,647	811,103,857	13.42%	-1.88%	0.26%	5.93%
2029	6,451,949,075	7,598,241,913	14,050,190,988	874,156,693	(141,474,664)	36,276,041	768,958,070	13.55%	-1.86%	0.26%	5.47%
2030	6,139,439,553	8,303,593,686	14,443,033,239	839,591,223	(152,993,400)	37,290,317	723,888,140	13.68%	-1.84%	0.26%	5.01%
2031	5,807,888,077	9,042,236,865	14,850,124,942	802,173,455	(165,382,724)	38,341,383	675,132,113	13.81%	-1.83%	0.26%	4.55%
2032	5,457,641,988	9,812,453,739	15,270,095,727	762,027,891	(177,916,998)	39,425,701	623,536,594	13.96%	-1.81%	0.26%	4.08%
2033	5,086,375,486	10,614,805,124	15,701,180,610	718,942,862	(190,651,126)	40,538,714	568,830,450	14.13%	-1.80%	0.26%	3.62%
2034	4,693,031,761	11,448,664,944	16,141,696,705	673,744,495	(203,472,035)	41,676,078	511,948,538	14.36%	-1.78%	0.26%	3.17%
2035	4,289,297,394	12,307,359,304	16,596,656,698	626,965,030	(216,066,322)	42,850,735	453,749,442	14.62%	-1.76%	0.26%	2.73%
2036	3,877,939,332	13,189,142,773	17,067,082,105	580,096,118	(228,914,924)	44,065,321	395,246,516	14.96%	-1.74%	0.26%	2.32%
2037	3,470,862,875	14,085,618,208	17,556,481,083	531,902,422	(240,744,601)	45,328,895	336,486,717	15.32%	-1.71%	0.26%	1.92%
2038	3,057,213,976	15,000,151,166	18,057,365,142	479,242,649	(252,490,119)	46,622,123	273,374,652	15.68%	-1.68%	0.26%	1.51%
2039	2,631,054,643	15,933,365,768	18,564,420,411	421,719,403	(264,022,970)	47,931,283	205,627,717	16.03%	-1.66%	0.26%	1.11%
2040	2,207,637,044	16,871,942,967	19,079,580,011	360,077,494	(274,366,402)	49,261,368	134,972,460	16.31%	-1.63%	0.26%	0.71%
2041	1,793,322,712	17,800,793,436	19,594,116,148	296,200,412	(282,894,301)	50,589,844	63,895,954	16.52%	-1.59%	0.26%	0.33%
2042	1,405,141,619	18,707,708,117	20,112,849,736	232,882,189	(288,304,043)	51,929,157	(3,492,696)	16.57%	-1.54%	0.26%	-0.02%
2043	1,053,927,479	19,586,887,696	20,640,815,175	172,707,782	(291,859,098)	53,292,305	(65,859,011)	16.39%	-1.49%	0.26%	-0.32%
2044	744,365,567	20,426,651,337	21,171,016,904	119,230,646	(293,059,862)	54,661,228	(119,167,989)	16.02%	-1.43%	0.26%	-0.56%
2045	489,486,969	21,192,700,673	21,682,187,642	77,147,569	(289,330,937)	55,981,014	(156,202,354)	15.76%	-1.37%	0.26%	-0.72%

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

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**TABLE 12**

**Projections – Projection of Debt Service to 2033**

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<b>Fiscal Year</b>	<b>Debt Service</b>
2017	\$352,224,565
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**

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**EXHIBIT 1**

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

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<b>Fiscal Year ended June 30</b>	<b>Actuarially Determined Contribution (ADC)*</b>	<b>Percentage Contributed</b>
2008	\$1,949,463	60.0%
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%

*\*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, 2015, was contributed in the fiscal year ending June 30, 2017).

**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)**

<b>Fiscal Year</b>	<b>Actuarially Determined Contributions</b>	<b>State Contributions</b>	<b>Federal and Employer Contributions</b>	<b>Total</b>	<b>Contribution Deficiency</b>	<b>Covered Payroll</b>	<b>Contributions as a Percentage of Covered Employee Payroll</b>
2008	\$1,949,463	\$1,039,195	\$130,578	\$1,169,773	\$779,690	\$8,521,717	13.7%
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	9,641,148	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%



**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)
6/30/2008	\$38,430,723	\$68,632,367	\$30,201,644	56.0%	\$8,521,717	354.4%
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%

**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)
2008	\$6,931,518	\$41,849,964	\$19,850,885	\$38,430,723	100%	75%	0%
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%

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

**EXHIBIT 4**

**GASB 67 Net Pension Liability**

	<b>June 30, 2017</b>	<b>June 30, 2016</b>
<b>The components of the net pension liability:</b>		
Total pension liability	\$125,773,806,438	\$124,187,003,384
Plan fiduciary net position	<u>(49,375,664,518)</u>	<u>(45,250,956,731)</u>
Net pension liability	\$76,398,141,920	\$78,936,046,653
Plan fiduciary net position as a percentage of the total pension liability	39.3%	36.4%

*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, 2017.

*Actuarial assumptions.* The total pension liability was determined by an actuarial valuation as of June 30, 2017, using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	2.50%
Salary increases	9.25% at one year of service to 3.25% 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-2014.

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

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The actuarial assumptions used were based on the results of an experience study dated August 2015 and an analysis of economic assumptions in August 2016.

*Discount rate:* The discount rate used to measure the total pension liability was 7.00% as of June 30, 2017. 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, 2017, 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, 2017. 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, 2017.

*Sensitivity of the net pension liability to changes in the discount rate.* The following presents the net pension liability as of June 30, 2017, 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:

	<b>1% Decrease (6.00%)</b>	<b>Current Discount Rate (7.00%)</b>	<b>1% Increase (8.00%)</b>
Net pension liability as of June 30, 2017	\$93,865,095,009	\$76,398,141,920	\$62,091,251,142

**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**

	<b>2017</b>	<b>2016</b>
<b>Total pension liability</b>		
Service cost	\$1,877,570,053	\$1,681,242,232
Interest	8,390,352,464	8,264,257,311
Change of benefit terms	0	0
Differences between expected and actual experience	482,486,212	701,827,169
Changes of assumptions	(2,725,599,755)	7,553,894,504
Benefit payments, including refunds of employee contributions	<u>(6,438,005,920)</u>	<u>(5,931,207,177)</u>
<b>Net change in total pension liability</b>	\$1,586,803,054	\$12,270,014,039
<b>Total pension liability – beginning</b>	<u>124,187,003,384</u>	<u>111,916,989,345</u>
<b>Total pension liability – ending (a)</b>	<u>\$125,773,806,438</u>	<u>\$124,187,003,384</u>
<b>Plan fiduciary net position</b>		
Contributions – employer	\$149,495,577	\$148,040,767
Contributions – nonemployer contributing entity	3,986,363,699	3,742,469,245
Contributions – member	929,130,165	951,809,398
Net investment income	5,520,453,001	(44,103,178)
Benefit payments, including refunds of employee contributions	(6,438,005,920)	(5,931,207,177)
Administrative expense	<u>(22,728,735)</u>	<u>(22,967,917)</u>
<b>Net change in plan fiduciary net position</b>	\$4,124,707,787	(\$1,155,958,862)
<b>Plan fiduciary net position – beginning</b>	<u>45,250,956,731</u>	<u>46,406,915,593</u>
<b>Plan fiduciary net position – ending (b)</b>	<u>\$49,375,664,518</u>	<u>\$45,250,956,731</u>
<b>Net pension liability – ending (a) – (b)</b>	\$76,398,141,920	\$78,936,046,653
<b>Plan fiduciary net position as a percentage of the total pension liability</b>	39.3%	36.4%
<b>Actual covered employee payroll</b>	\$9,965,569,893	\$9,811,614,284
<b>Plan net pension liability as percentage of covered employee payroll</b>	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**

	<b>Increase/(Decrease) For Fiscal Year Ending June 30, 2017</b>		
	<b>Total Pension Liability (a)</b>	<b>Plan Fiduciary Net Position (b)</b>	<b>Net Pension Liability (a) – (b)</b>
<b>Balances at beginning of year</b>	\$124,187,003,384	\$45,250,956,731	\$78,936,046,653
<b>Changes for the year</b>			
Service cost	1,877,570,053		1,877,570,053
Interest	8,390,352,464		8,390,352,464
Differences between expected and actual experience	482,486,212		482,486,212
Contributions – employer		149,495,577	(149,495,577)
Contributions – nonemployer contributing entity		3,986,363,699	(3,986,363,699)
Contributions – member		929,130,165	(929,130,165)
Net investment income		5,520,453,001	(5,520,453,001)
Benefit payments, including refunds of employee contributions	(6,438,005,920)	(6,438,005,920)	0
Administrative expense		(22,728,735)	22,728,735
Change of assumptions	<u>(2,725,599,755)</u>	<u>0</u>	<u>(2,725,599,755)</u>
<b>Net changes</b>	1,586,803,054	4,124,707,787	(2,537,904,733)
<b>Balances at end of year</b>	<u>\$125,773,806,438</u>	<u>\$49,375,664,518</u>	<u>\$76,398,141,920</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**

	<b>Year Established</b>	<b>Original Balance</b>	<b>Original Amortization Period</b>	<b>Amortization Amount</b>	<b>Outstanding Balance at June 30, 2017</b>
<b>Outflows</b>					
Demographic	2014	\$39,950,212	5.12	\$7,802,776	\$8,739,108
Investment	2015	1,621,728,539	5.00	324,345,708	648,691,415
Assumption	2015	1,136,454,886	4.93	230,518,233	444,900,187
Demographic	2016	701,827,169	5.21	134,707,710	432,411,749
Investment	2016	3,482,927,259	5.00	696,585,452	2,089,756,355
Assumption	2016	7,553,894,504	5.21	1,449,883,782	4,654,126,940
Demographic	2017	482,486,212	5.14*	<u>93,868,913</u>	<u>388,617,299</u>
<b>Total outflows</b>				<b>\$2,937,712,574</b>	<b>\$8,667,243,053</b>
<b>Inflows</b>					
Investment	2014	\$3,823,239,747	5.00	\$764,647,950	\$764,647,947
Demographic	2015	90,079,446	4.93	18,271,693	35,264,367
Investment	2017	2,401,737,113	5.00	480,347,423	1,921,389,690
Assumption	2017	2,725,599,755	5.14*	<u>530,272,326</u>	<u>2,195,327,429</u>
<b>Total inflows</b>				<b>\$1,793,539,392</b>	<b>\$4,916,629,433</b>

\* Equal to the total expected remaining service lives of 2,130,453 years, divided by total employees that are provided with pensions through the plan of 414,357 (as shown in the table below), rounded to two decimal places.

	<b>Expected Remaining Service</b>	<b>Counts</b>	<b>Average of the Expected Remaining Service</b>
Actives Members	2,130,453	159,585	13.35
Inactive Members	-	136,855	-
Retirees and Beneficiaries	-	117,917	-
<b>Total Employees</b>	<b>2,130,453</b>	<b>414,357</b>	<b>5.14</b>

**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, 2017, 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	\$829,768,156	\$35,264,367
Changes of assumptions	5,099,027,127	2,195,327,429
Net differences between projected and actual earnings on pension plan investments	<u>52,410,133</u>	<u>-</u>
<b>Total</b>	<u><u>\$5,981,205,416</u></u>	<u><u>\$2,230,591,796</u></u>

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

<b>Year ended June 30:</b>	
2018	\$1,144,173,185
2019	1,887,097,427
2020	1,364,426,107
2021	(583,986,621)
2022	(61,096,478)
Thereafter	-



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

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**EXHIBIT 8**

**GASB 68 Collective Pension Expense**

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	<b>Fiscal Year Ending June 30, 2017</b>	<b>Fiscal Year Ending June 30, 2016</b>
<b>Components of pension expense</b>		
Service cost	\$1,877,570,053	\$1,681,242,232
Interest on the total pension liability	8,390,352,464	8,264,257,311
Projected earnings on plan investments	(3,118,715,888)	(3,438,824,081)
Contributions – member	(929,130,165)	(951,809,398)
Administrative expense	22,728,735	22,967,917
Current year recognition of:		
Changes of assumptions	1,150,129,689	1,680,402,015
Difference between expected and actual experience	218,107,706	124,238,793
Difference between projected and actual earnings on pension plan investments	(224,064,213)	256,283,210
Change of benefit terms	-	-
<b>Total pension expense</b>	<u>\$7,386,978,381</u>	<u>\$7,638,757,999</u>

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**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				
2018	\$49,375,664,518	\$5,114,051,089	\$6,538,238,592	\$26,549,011	\$3,405,520,738	\$51,330,448,742
2019	51,330,448,742	5,474,881,319	6,800,989,818	26,422,691	3,545,792,820	53,523,710,372
2020	53,523,710,372	5,792,296,294	7,065,526,489	26,268,417	3,701,177,275	55,925,389,035
2021	55,925,389,035	6,056,603,141	7,330,802,873	26,217,308	3,869,262,636	58,494,234,632
2022	58,494,234,632	6,292,906,977	7,601,290,236	26,248,015	4,047,884,330	61,207,487,688
2023	61,207,487,688	6,394,455,589	7,882,763,783	26,327,595	4,231,511,886	63,924,363,785
2024	63,924,363,785	6,517,871,810	8,164,914,793	26,496,029	4,416,131,599	66,666,956,371
2025	66,666,956,371	6,647,780,752	8,453,000,663	26,696,762	4,602,569,862	69,437,609,560
2026	69,437,609,560	6,798,638,186	8,748,303,324	26,913,641	4,791,452,412	72,252,483,194
2027	72,252,483,194	6,953,992,926	9,057,755,575	27,140,123	4,983,092,227	75,104,672,648
2028	75,104,672,648	7,098,672,394	9,374,186,460	27,365,928	5,176,726,286	77,978,518,939
2029	77,978,518,939	7,248,835,961	9,694,938,311	27,586,377	5,371,917,220	80,876,747,432
2030	80,876,747,432	7,392,825,498	10,021,452,618	27,818,942	5,568,396,708	83,788,698,078
2031	83,788,698,078	7,546,082,706	10,356,917,890	28,051,875	5,765,847,818	86,715,658,836
2032	86,715,658,836	7,721,731,525	10,693,955,855	28,275,277	5,965,078,632	89,680,237,862
2033	89,680,237,862	7,918,283,650	11,039,682,380	28,483,157	6,167,370,784	92,697,726,759
2034	92,697,726,759	8,742,419,485	11,379,857,852	28,671,319	6,395,527,034	96,427,144,107
2035	96,427,144,107	8,942,592,804	11,719,192,224	28,844,947	6,651,709,535	100,273,409,276
2036	100,273,409,276	9,149,331,892	12,048,081,551	29,010,886	6,916,667,030	104,262,315,761
2037	104,262,315,761	9,363,905,687	12,362,881,679	29,172,930	7,192,376,891	108,426,543,730
2038	108,426,543,730	9,584,267,229	12,665,071,849	29,320,420	7,481,003,685	112,797,422,375
2039	112,797,422,375	9,806,304,689	12,959,167,318	29,440,549	7,784,438,955	117,399,558,152
2040	117,399,558,152	10,030,131,015	13,231,023,741	29,527,112	8,104,904,376	122,274,042,689
2041	122,274,042,689	10,251,800,596	13,470,654,780	29,576,643	8,445,487,909	127,471,099,771
2042	127,471,099,771	10,473,529,159	13,671,008,758	29,599,502	8,810,029,215	133,054,049,884
2043	133,054,049,884	10,701,081,806	13,847,862,816	29,610,134	9,202,609,802	139,080,268,542
2044	139,080,268,542	10,930,370,106	13,965,422,447	29,602,405	9,628,355,882	145,643,969,678
2045	145,643,969,678	11,149,131,973	14,027,950,388	29,543,981	10,093,285,194	152,828,892,476
2046	152,828,892,476	1,574,797,224	14,038,240,803	29,469,830	10,260,770,504	150,596,749,570
2047	150,596,749,570	1,539,362,386	14,023,653,591	29,384,750	10,103,793,811	148,186,867,426
2048	148,186,867,426	1,525,993,678	13,993,587,875	29,283,602	9,935,689,997	145,625,679,624
2049	145,625,679,624	1,515,819,493	13,923,323,702	29,046,012	9,758,518,316	142,947,647,718
2050	142,947,647,718	1,507,819,671	13,840,436,276	28,767,044	9,573,686,913	140,159,950,983
2051	140,159,950,983	1,501,035,361	13,763,857,905	28,447,928	9,381,002,102	137,249,682,613
2052	137,249,682,613	1,494,436,206	13,681,299,378	28,090,066	9,179,954,420	134,214,683,795
2053	134,214,683,795	1,487,205,801	13,726,194,172	27,695,014	8,965,693,947	130,913,694,357
2054	130,913,694,357	1,479,005,790	13,689,223,248	27,264,472	8,735,646,737	127,411,859,164

**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				
2055	\$127,411,859,164	\$1,470,463,599	\$13,619,134,176	\$26,800,279	\$8,492,688,661	\$123,729,076,968
2056	123,729,076,968	1,462,041,583	13,533,742,374	26,304,390	8,237,605,206	119,868,676,992
2057	119,868,676,992	1,454,080,511	13,423,508,345	25,778,869	7,970,975,155	115,844,445,444
2058	115,844,445,444	1,446,640,421	13,439,582,699	25,225,871	7,688,475,296	111,514,752,591
2059	111,514,752,591	1,440,041,355	13,345,208,991	24,647,632	7,388,489,147	106,973,426,470
2060	106,973,426,470	1,434,655,672	13,193,392,987	24,046,447	7,075,742,421	102,266,385,129
2061	102,266,385,129	1,430,494,496	13,016,693,557	23,424,663	6,752,310,129	97,409,071,534
2062	97,409,071,534	1,427,408,577	12,798,351,187	22,784,656	6,419,854,553	92,435,198,822
2063	92,435,198,822	1,425,330,002	12,570,484,654	22,128,822	6,079,608,996	87,347,524,343
2064	87,347,524,343	1,423,969,216	12,315,861,128	21,459,560	5,732,359,402	82,166,532,273
2065	82,166,532,273	1,422,835,758	12,013,036,639	20,782,446	5,380,272,843	76,935,821,788
2066	76,935,821,788	1,421,931,513	11,688,075,213	20,107,932	5,025,488,718	71,675,058,875
2067	71,675,058,875	1,421,176,083	11,325,790,329	19,437,170	4,669,912,322	66,420,919,781
2068	66,420,919,781	1,420,488,387	10,937,502,530	18,771,267	4,315,711,895	61,200,846,266
2069	61,200,846,266	1,419,864,930	10,523,358,095	18,111,274	3,964,803,083	56,044,044,909
2070	56,044,044,909	1,419,306,680	10,084,227,325	17,458,195	3,619,199,884	50,980,865,953
2071	50,980,865,953	1,418,813,926	9,622,100,184	16,812,975	3,280,957,144	46,041,723,864
2072	46,041,723,864	1,418,387,161	9,139,472,989	16,176,505	2,952,116,489	41,256,578,021
2073	41,256,578,021	1,418,026,991	8,639,159,694	15,549,618	2,634,676,580	36,654,572,280
2074	36,654,572,280	1,417,733,913	8,124,146,748	14,933,088	2,330,572,952	32,263,799,309
2075	32,263,799,309	1,417,508,483	7,597,761,983	14,327,633	2,041,655,612	28,110,873,788
2076	28,110,873,788	1,417,351,265	7,064,369,615	13,733,909	1,769,634,836	24,219,756,365
2077	24,219,756,365	1,417,262,831	6,528,122,219	13,152,514	1,516,042,529	20,611,786,993
2078	20,611,786,993	1,417,243,759	5,993,406,789	12,583,987	1,282,218,944	17,305,258,919
2079	17,305,258,919	1,417,294,638	5,464,812,030	12,028,810	1,069,284,007	14,314,996,723
2080	14,314,996,723	1,417,416,065	4,946,950,381	11,487,406	878,114,010	11,652,089,011
2081	11,652,089,011	1,417,608,644	4,444,334,266	10,960,142	709,327,229	9,323,730,475
2082	9,323,730,475	1,417,872,990	3,961,189,405	10,447,329	563,279,402	7,333,246,133
2083	7,333,246,133	1,418,209,725	3,501,318,664	9,949,225	440,070,194	5,680,258,163
2084	5,680,258,163	1,418,619,481	3,068,119,450	9,466,036	339,554,261	4,360,846,420
2085	4,360,846,420	1,419,102,898	2,664,397,035	8,997,916	261,359,028	3,367,913,395
2086	3,367,913,395	1,419,660,625	2,292,409,309	8,544,971	204,908,660	2,691,528,401
2087	2,691,528,401	1,420,293,322	1,953,494,510	8,107,262	169,461,192	2,319,681,144
2088	2,319,681,144	1,421,001,656	1,648,193,332	7,684,802	154,157,003	2,238,961,670
2089	2,238,961,670	1,421,786,305	1,376,408,929	7,277,564	158,060,810	2,435,122,292
2090	2,435,122,292	1,422,647,955	1,137,328,885	6,885,481	180,203,736	2,893,759,616
2091	2,893,759,616	1,423,587,303	929,726,901	6,508,448	219,620,492	3,600,732,063
2092	3,600,732,063	1,424,605,056	751,641,793	6,146,325	275,389,837	4,542,938,837

**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				
2093	\$4,542,938,837	\$1,425,701,930	\$600,631,366	\$5,798,938	\$346,680,226	\$5,708,890,689
2094	5,708,890,689	1,426,878,650	474,116,037	5,466,084	432,777,727	7,088,964,946
2095	7,088,964,946	1,428,135,954	369,436,230	5,147,532	533,101,873	8,675,619,011
2096	8,675,619,011	1,429,474,588	283,990,888	4,843,025	647,215,754	10,463,475,439
2097	10,463,475,439	1,430,895,309	215,204,577	4,552,283	774,833,126	12,449,447,014
2098	12,449,447,014	1,432,398,884	160,559,245	4,275,006	915,826,053	14,632,837,700
2099	14,632,837,700	1,433,986,091	117,779,083	4,010,874	1,070,225,504	17,015,259,338
2100	17,015,259,338	1,435,657,720	84,866,486	3,759,554	1,238,214,262	19,600,505,280
2101	19,600,505,280	1,437,414,569	59,956,527	3,520,695	1,420,123,177	22,394,565,803
2102	22,394,565,803	1,439,257,450	41,417,470	3,293,938	1,616,428,718	25,405,540,563
2103	25,405,540,563	1,441,187,184	27,909,836	3,078,913	1,827,744,785	28,643,483,783
2104	28,643,483,783	1,443,204,604	18,312,300	2,875,241	2,054,814,462	32,120,315,307
2105	32,120,315,307	1,445,310,555	11,673,206	2,682,538	2,298,505,490	35,849,775,609
2106	35,849,775,609	1,447,505,894	7,202,575	2,500,418	2,559,807,394	39,847,385,903
2107	39,847,385,903	1,449,791,487	4,275,825	2,328,488	2,839,828,564	44,130,401,641
2108	44,130,401,641	1,452,168,214	2,442,867	2,166,359	3,139,792,679	48,717,753,307
2109	48,717,753,307	1,454,636,967	1,339,238	2,013,640	3,461,037,675	53,630,075,071
2110	53,630,075,071	1,457,198,650	704,172	1,869,941	3,805,017,114	58,889,716,721
2111	58,889,716,721	1,459,854,178	353,885	1,734,879	4,173,301,960	64,520,784,095
2112	64,520,784,095	1,462,604,480	170,010	1,608,071	4,567,583,811	70,549,194,306
2113	70,549,194,306	1,465,450,497	80,729	1,489,142	4,989,679,423	77,002,754,355
2114	77,002,754,355	1,468,393,183	37,404	1,377,723	5,441,537,037	83,911,269,448
2115	83,911,269,448	1,471,433,503	17,122	1,273,452	5,925,243,864	91,306,656,242
2116	91,306,656,242	1,474,572,439	6,598	1,175,975	6,443,034,582	99,223,080,690
2117	99,223,080,690	1,477,810,982	1,205	1,084,947	6,997,301,017	107,697,106,536
2118	107,697,106,536	1,481,150,139	530	1,000,032	7,590,602,693	116,767,858,806
2119	116,767,858,806	1,484,590,929	173	920,904	8,225,678,561	126,477,207,218
2120	126,477,207,218	1,488,134,385	0	847,246	8,905,459,555	136,869,953,913

**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 3.58%	Present Value of Benefit Payments at 7.00%
2018	\$49,375,664,518	\$6,538,238,592	\$6,538,238,592	\$0	\$6,320,753,821	\$0	\$6,320,753,821
2019	51,330,448,742	6,800,989,818	6,800,989,818	0	6,144,640,204	0	6,144,640,204
2020	53,523,710,372	7,065,526,489	7,065,526,489	0	5,966,025,217	0	5,966,025,217
2021	55,925,389,035	7,330,802,873	7,330,802,873	0	5,785,066,019	0	5,785,066,019
2022	58,494,234,632	7,601,290,236	7,601,290,236	0	5,606,093,228	0	5,606,093,228
2023	61,207,487,688	7,882,763,783	7,882,763,783	0	5,433,350,668	0	5,433,350,668
2024	63,924,363,785	8,164,914,793	8,164,914,793	0	5,259,653,109	0	5,259,653,109
2025	66,666,956,371	8,453,000,663	8,453,000,663	0	5,089,001,400	0	5,089,001,400
2026	69,437,609,560	8,748,303,324	8,748,303,324	0	4,922,227,952	0	4,922,227,952
2027	72,252,483,194	9,057,755,575	9,057,755,575	0	4,762,935,595	0	4,762,935,595
2028	75,104,672,648	9,374,186,460	9,374,186,460	0	4,606,848,412	0	4,606,848,412
2029	77,978,518,939	9,694,938,311	9,694,938,311	0	4,452,783,776	0	4,452,783,776
2030	80,876,747,432	10,021,452,618	10,021,452,618	0	4,301,634,003	0	4,301,634,003
2031	83,788,698,078	10,356,917,890	10,356,917,890	0	4,154,794,370	0	4,154,794,370
2032	86,715,658,836	10,693,955,855	10,693,955,855	0	4,009,346,681	0	4,009,346,681
2033	89,680,237,862	11,039,682,380	11,039,682,380	0	3,868,192,019	0	3,868,192,019
2034	92,697,726,759	11,379,857,852	11,379,857,852	0	3,726,529,001	0	3,726,529,001
2035	96,427,144,107	11,719,192,224	11,719,192,224	0	3,586,588,638	0	3,586,588,638
2036	100,273,409,276	12,048,081,551	12,048,081,551	0	3,446,021,727	0	3,446,021,727
2037	104,262,315,761	12,362,881,679	12,362,881,679	0	3,304,730,495	0	3,304,730,495
2038	108,426,543,730	12,665,071,849	12,665,071,849	0	3,164,027,251	0	3,164,027,251
2039	112,797,422,375	12,959,167,318	12,959,167,318	0	3,025,700,081	0	3,025,700,081
2040	117,399,558,152	13,231,023,741	13,231,023,741	0	2,887,077,558	0	2,887,077,558
2041	122,274,042,689	13,470,654,780	13,470,654,780	0	2,747,071,294	0	2,747,071,294
2042	127,471,099,771	13,671,008,758	13,671,008,758	0	2,605,541,580	0	2,605,541,580
2043	133,054,049,884	13,847,862,816	13,847,862,816	0	2,466,586,905	0	2,466,586,905
2044	139,080,268,542	13,965,422,447	13,965,422,447	0	2,324,791,284	0	2,324,791,284
2045	145,643,969,678	14,027,950,388	14,027,950,388	0	2,182,430,060	0	2,182,430,060
2046	152,828,892,476	14,038,240,803	14,038,240,803	0	2,041,150,481	0	2,041,150,481
2047	150,596,749,570	14,023,653,591	14,023,653,591	0	1,905,635,057	0	1,905,635,057
2048	148,186,867,426	13,993,587,875	13,993,587,875	0	1,777,149,076	0	1,777,149,076
2049	145,625,679,624	13,923,323,702	13,923,323,702	0	1,652,547,392	0	1,652,547,392
2050	142,947,647,718	13,840,436,276	13,840,436,276	0	1,535,242,574	0	1,535,242,574
2051	140,159,950,983	13,763,857,905	13,763,857,905	0	1,426,867,441	0	1,426,867,441
2052	137,249,682,613	13,681,299,378	13,681,299,378	0	1,325,522,232	0	1,325,522,232
2053	134,214,683,795	13,726,194,172	13,726,194,172	0	1,242,870,930	0	1,242,870,930
2054	130,913,694,357	13,689,223,248	13,689,223,248	0	1,158,433,000	0	1,158,433,000

**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 3.58%	Present Value of Benefit Payments at 7.00%
2055	\$127,411,859,164	\$13,619,134,176	\$13,619,134,176	\$0	\$1,077,104,488	\$0	\$1,077,104,488
2056	123,729,076,968	13,533,742,374	13,533,742,374	0	1,000,328,090	0	1,000,328,090
2057	119,868,676,992	13,423,508,345	13,423,508,345	0	927,271,301	0	927,271,301
2058	115,844,445,444	13,439,582,699	13,439,582,699	0	867,646,437	0	867,646,437
2059	111,514,752,591	13,345,208,991	13,345,208,991	0	805,190,432	0	805,190,432
2060	106,973,426,470	13,193,392,987	13,193,392,987	0	743,953,767	0	743,953,767
2061	102,266,385,129	13,016,693,557	13,016,693,557	0	685,971,941	0	685,971,941
2062	97,409,071,534	12,798,351,187	12,798,351,187	0	630,341,522	0	630,341,522
2063	92,435,198,822	12,570,484,654	12,570,484,654	0	578,615,599	0	578,615,599
2064	87,347,524,343	12,315,861,128	12,315,861,128	0	529,808,743	0	529,808,743
2065	82,166,532,273	12,013,036,639	12,013,036,639	0	482,973,566	0	482,973,566
2066	76,935,821,788	11,688,075,213	11,688,075,213	0	439,167,082	0	439,167,082
2067	71,675,058,875	11,325,790,329	11,325,790,329	0	397,714,589	0	397,714,589
2068	66,420,919,781	10,937,502,530	10,937,502,530	0	358,952,840	0	358,952,840
2069	61,200,846,266	10,523,358,095	10,523,358,095	0	322,767,500	0	322,767,500
2070	56,044,044,909	10,084,227,325	10,084,227,325	0	289,064,194	0	289,064,194
2071	50,980,865,953	9,622,100,184	9,622,100,184	0	257,773,203	0	257,773,203
2072	46,041,723,864	9,139,472,989	9,139,472,989	0	228,825,948	0	228,825,948
2073	41,256,578,021	8,639,159,694	8,639,159,694	0	202,149,113	0	202,149,113
2074	36,654,572,280	8,124,146,748	8,124,146,748	0	177,661,907	0	177,661,907
2075	32,263,799,309	7,597,761,983	7,597,761,983	0	155,281,053	0	155,281,053
2076	28,110,873,788	7,064,369,615	7,064,369,615	0	134,934,318	0	134,934,318
2077	24,219,756,365	6,528,122,219	6,528,122,219	0	116,534,228	0	116,534,228
2078	20,611,786,993	5,993,406,789	5,993,406,789	0	99,989,686	0	99,989,686
2079	17,305,258,919	5,464,812,030	5,464,812,030	0	85,206,534	0	85,206,534
2080	14,314,996,723	4,946,950,381	4,946,950,381	0	72,086,087	0	72,086,087
2081	11,652,089,011	4,444,334,266	4,444,334,266	0	60,525,284	0	60,525,284
2082	9,323,730,475	3,961,189,405	3,961,189,405	0	50,416,414	0	50,416,414
2083	7,333,246,133	3,501,318,664	3,501,318,664	0	41,648,005	0	41,648,005
2084	5,680,258,163	3,068,119,450	3,068,119,450	0	34,107,591	0	34,107,591
2085	4,360,846,420	2,664,397,035	2,664,397,035	0	27,681,776	0	27,681,776
2086	3,367,913,395	2,292,409,309	2,292,409,309	0	22,258,884	0	22,258,884
2087	2,691,528,401	1,953,494,510	1,953,494,510	0	17,727,180	0	17,727,180
2088	2,319,681,144	1,648,193,332	1,648,193,332	0	13,978,219	0	13,978,219
2089	2,238,961,670	1,376,408,929	1,376,408,929	0	10,909,564	0	10,909,564
2090	2,435,122,292	1,137,328,885	1,137,328,885	0	8,424,850	0	8,424,850
2091	2,893,759,616	929,726,901	929,726,901	0	6,436,470	0	6,436,470
2092	3,600,732,063	751,641,793	751,641,793	0	4,863,170	0	4,863,170

**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 3.58%	Present Value of Benefit Payments at 7.00%
2093	\$4,542,938,837	\$600,631,366	\$600,631,366	\$0	\$3,631,891	\$0	\$3,631,891
2094	5,708,890,689	474,116,037	474,116,037	0	2,679,327	0	2,679,327
2095	7,088,964,946	369,436,230	369,436,230	0	1,951,177	0	1,951,177
2096	8,675,619,011	283,990,888	283,990,888	0	1,401,774	0	1,401,774
2097	10,463,475,439	215,204,577	215,204,577	0	992,753	0	992,753
2098	12,449,447,014	160,559,245	160,559,245	0	692,215	0	692,215
2099	14,632,837,700	117,779,083	117,779,083	0	474,559	0	474,559
2100	17,015,259,338	84,866,486	84,866,486	0	319,576	0	319,576
2101	19,600,505,280	59,956,527	59,956,527	0	211,004	0	211,004
2102	22,394,565,803	41,417,470	41,417,470	0	136,224	0	136,224
2103	25,405,540,563	27,909,836	27,909,836	0	85,792	0	85,792
2104	28,643,483,783	18,312,300	18,312,300	0	52,607	0	52,607
2105	32,120,315,307	11,673,206	11,673,206	0	31,341	0	31,341
2106	35,849,775,609	7,202,575	7,202,575	0	18,073	0	18,073
2107	39,847,385,903	4,275,825	4,275,825	0	10,027	0	10,027
2108	44,130,401,641	2,442,867	2,442,867	0	5,354	0	5,354
2109	48,717,753,307	1,339,238	1,339,238	0	2,743	0	2,743
2110	53,630,075,071	704,172	704,172	0	1,348	0	1,348
2111	58,889,716,721	353,885	353,885	0	633	0	633
2112	64,520,784,095	170,010	170,010	0	284	0	284
2113	70,549,194,306	80,729	80,729	0	126	0	126
2114	77,002,754,355	37,404	37,404	0	55	0	55
2115	83,911,269,448	17,122	17,122	0	23	0	23
2116	91,306,656,242	6,598	6,598	0	8	0	8
2117	99,223,080,690	1,205	1,205	0	1	0	1
2118	107,697,106,536	530	530	0	1	0	1
2119	116,767,858,806	173	173	0	0	0	0
2120	126,477,207,218	0	0	0	0	0	0
Total					\$142,194,851,020	\$0	\$142,194,851,020

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

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**Summary of Assumptions and Methods**

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<b>Rationale for Assumptions:</b>	<p>The information and analysis used in supporting each assumption that has a significant effect on this valuation is shown in the demographic experience review dated August 13, 2015 and the economic experience review presented at the August 2016 Board meeting.</p> <p>All assumptions were adopted by the Board effective June 30, 2015, unless otherwise noted.</p>
<b>Interest Rate:</b>	<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>
<b>Mortality Rates:</b>	
<b>Healthy Post-Retirement:</b>	<p>RP-2014 White Collar Annuitant Tables projected generationally with Scale MP-2014, with female rates multiplied by 76% for ages 50 to 77 and 106% for ages 78 to 114 and male rates multiplied by 115% for ages 78 to 114.</p>
<b>Disabled Post-Retirement:</b>	<p>RP-2014 Disabled Retiree Tables projected generationally with Scale MP-2014.</p>
<b>Beneficiary Post-Retirement:</b>	<p>RP-2014 White Collar Annuitant Tables projected generationally with Scale MP-2014, with female and male rates multiplied by 112% for ages 50 to 114.</p>
<b>Pre-Retirement:</b>	<p>RP-2014 White Collar Employee Tables projected generationally with Scale MP-2014.</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, 0.75% real wage growth and 0.25% for employment type and status changes. (Adopted effective June 30, 2016.) Salary increase rates are shown below.

Service	Rate
1	9.25%
2	7.25%
3	6.75%
4	6.45%
5	6.25%
10	5.25%
15	4.25%
20 and above	3.25%

For a member who works 34 years, the assumed average salary increase over their career is 4.44% per year.

**Retirement Rates:**

The following rates of retirement are assumed for members hired before January 1, 2011:

Age	Service				
	5 – 18	19 – 30	31	32 - 33	34+
54	0%	6%	8%	38%	60%
55	0%	10%	8%	38%	60%
56	0%	7%	8%	38%	45%
57	0%	7%	12%	40%	45%
58	0%	7%	12%	40%	40%
59	0%	25%	38%	60%	40%
60	14%	30%	48%	60%	40%
61	14%	27%	33%	45%	40%
62	14%	27%	50%	45%	40%
63	14%	27%	38%	50%	40%
64	24%	37%	50%	60%	40%
65	26%	37%	50%	50%	40%
66	26%	37%	50%	50%	40%
67	26%	37%	50%	50%	40%
68	26%	33%	50%	50%	40%
69	26%	33%	50%	50%	40%
70	100%	100%	100%	100%	100%

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

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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%

**Disability Rates:**

Shown below for selected ages.

Age	Male	Female
25	0.029%	0.030%
30	0.023%	0.061%
35	0.030%	0.069%
40	0.051%	0.112%
45	0.068%	0.140%
50	0.117%	0.192%
55	0.138%	0.240%
60	0.179%	0.227%
65	0.536%	0.410%

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

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**Termination Rates:**

Termination rates based on service, for causes other than death, disability, or retirement.

Age	Under 5 Years of Service		5 or More Years of Service	
	Male	Female	Male	Female
25	9.5%	8.4%	6.0%	6.5%
30	8.8%	11.3%	2.8%	5.0%
35	10.2%	11.6%	2.1%	3.5%
40	12.3%	10.8%	1.7%	2.2%
45	12.6%	10.3%	1.5%	1.9%
50	16.7%	11.8%	1.9%	1.7%
55	20.7%	17.0%	5.0%	3.8%
60	16.4%	16.9%	4.6%	4.0%
65	30.2%	35.0%	4.6%	4.0%

**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.

**Severance Pay:**

20% of retirees are assumed to receive severance pay and the average severance payment will be 2.5% of other pensionable earnings in the last year of employment.

**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:

Service	Maximum Service Purchased
10 years	0.204 years
20 years	0.537 years
25 years	1.029 years
30 years	1.424 years
34 or more	None

- a. Actual optional service credit for each current member is provided by TRS;

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

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- 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:

<b>Service</b>	<b>Sick Leave Service Credit</b>
20 years	0.938 years
25 years	1.115 years
30 years	1.276 years
34 years	1.450 years
35 or more	None

**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.)

**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:**

\$26,549,011 of administrative expenses is expected to be paid for the year beginning July 1, 2017. \$27,496,337 of administrative expenses is expected to be paid for the year beginning July 1, 2018 and each year thereafter, increased by the rate at which payroll is expected to increase.

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

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<b>Asset Valuation Method:</b>	<p>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.</p>
<b>Actuarial Cost Method:</b>	<p>Projected Unit Credit (adopted 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 (“Actuarial Math 2.0”), 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>
<b>Amortization Period and Method:</b>	<p>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 Actuarial Math 2.0, 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.</p>

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

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**Summary of Plan Provisions**

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**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

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- 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**

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“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.

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\* 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**

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**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 <b>or</b> \$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 <b>or</b> \$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*** <b>or</b> \$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*** <b>or</b> \$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**

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**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**

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**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**

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- 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.

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

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### Definitions of Terms

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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**

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<b>Actuarial Math:</b>	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.
<b>Actuarial Math 2.0:</b>	The term given to the Board's funding policy. The contribution determined under Actuarial Math 2.0 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.
<b>Actuarial Present Value (APV):</b>	<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"><li>Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)</li><li>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, and</li><li>Discounted according to an assumed rate (or rates) of return to reflect the time value of money.</li></ol>
<b>Actuarial Present Value of Future Plan Benefits:</b>	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**

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<b>Actuarial Valuation:</b>	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).
<b>Actuarial Value of Assets:</b>	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.
<b>Actuarially Determined:</b>	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.
<b>Actuarially Determined Contribution (ADC):</b>	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.
<b>Amortization Method:</b>	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.
<b>Amortization Payment:</b>	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**

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**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**

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<b>Funded Ratio:</b>	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.
<b>GASB 25 and GASB 27:</b>	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.
<b>GASB 67 and GASB 68:</b>	Governmental Accounting Standards Board Statements No. 67 and No. 68 are the successor statements to GASB Statements No. 25 and No. 27.
<b>Investment Return:</b>	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.
<b>Net Pension Liability (NPL):</b>	The Net Pension Liability is equal to the Total Pension Liability minus the Plan Fiduciary Net Position.
<b>Normal Cost:</b>	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.
<b>Open Amortization Period:</b>	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.
<b>Plan Fiduciary Net Position:</b>	Market value of assets.

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

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<b>Total Pension Liability (TPL):</b>	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.
<b>Unfunded Actuarial Accrued Liability (UAAL):</b>	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.
<b>Valuation Date or Actuarial Valuation Date:</b>	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**

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### **History of Legislative Changes**

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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**

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- 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.

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

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

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