

Public School Teachers' Pension and Retirement Fund of Chicago

Statutorily Required Funding
Valuation as of June 30, 2013





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December 13, 2013

Board of Trustees
Public School Teachers' Pension
and Retirement Fund of Chicago
203 North LaSalle Street, Suite 2600
Chicago, Illinois 60601

Dear Board Members:

We are pleased to submit this combined actuarial valuation as of June 30, 2013 of the pension and retiree health insurance benefits provided under the Fund. It summarizes the actuarial data used in the valuation, measures the overall funded status of the plan, and establishes the statutorily required contributions for the fiscal year ending June 30, 2015.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Public School Teachers' Pension and Retirement Fund of Chicago. The census and financial information on which our calculations were based was prepared by the Fund staff. That assistance is gratefully acknowledged. We have not subjected the census data to any auditing procedures, but have examined the data for reasonableness and consistency with the prior year's data.

Since the effective date of the last actuarial valuation, there have not been any changes in benefit provisions that have had an impact on the actuarial liabilities of the Fund.

The actuarial assumptions and methods are set by the Board of Trustees, based upon recommendations made by the Fund's actuary. The assumptions and methods used for the June 30, 2013 actuarial valuation were based on an experience analysis covering the five-year period ending June 30, 2012 and were adopted by the Board, effective for the June 30, 2013 valuation. In our opinion, the assumptions as approved by the Board are reasonably related to the experience of the Fund.

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; and changes in plan provisions or applicable law.

The actuarial calculations were directed under our supervision. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Fund.

We look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,

SEGAL CONSULTING

By:



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SECTION 1: Valuation Summary for the Public School Teachers' Pension and Retirement Fund of Chicago

Purpose

This report has been prepared by Segal Consulting to present a combined valuation of the pension and retiree health insurance benefits of the Public School Teachers' Pension and Retirement Fund of Chicago (CTPF) as of June 30, 2013. The valuation was performed to determine the overall funded status and contribution requirements of the Fund. The required contributions presented in this report are based on:

- The benefit provisions of the Fund, as administered by the Board;
- The characteristics of covered active participants, inactive vested participants, and retired participants and beneficiaries as of June 30, 2013, provided by CTPF staff;
- The assets of the Fund as of June 30, 2013, provided by CTPF staff;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions regarding employee terminations, retirement, death, etc.

Significant Issues in Valuation Year

The following key findings were the result of this actuarial valuation:

1. The following assumption and method changes were approved by the Board of Trustees and are reflected in this valuation:
 - a. The investment return assumption was lowered from 8.00% to 7.75%.
 - b. The inflation assumption was lowered from 3.00% to 2.75%.
 - c. The payroll growth rate was lowered from 4.00% to 3.50%.
 - d. The assumption for future salary increases was revised from age-based rates ranging from 13.7% to 4.0% to age-based rates ranging from 15.75% to 4.25%.
 - e. The healthy mortality assumption changed from the UP-1994 Mortality Table, set back 3 years for males and set back 2 years for females to the RP-2000 Combined Healthy Mortality Table, set back 2 years with generational improvement from 2004 using Scale AA.

SECTION 1: Valuation Summary for the Public School Teachers' Pension and Retirement Fund of Chicago

- f. Disabled mortality changed from the RP-2000 Disabled Mortality Table set back 2 years for males and set forward 5 years for females to the RP-2000 Disabled Mortality Table set back 3 years for males and females.
 - g. The turnover rate assumption was revised from a 5-year service-based select table and separate age-based ultimate tables (one for at least 5 but less than 10 years of service and another for at least 10 years of service) to a 10-year service-based select table and an age-based ultimate table.
 - h. The retirement rate assumption was changed from using age-based rates for less than 33 years of service and for 33 or more years of service to age-based rates for less than 34 years of service and for 34 or more years of service. These rates were also revised to better reflect anticipated future experience.
 - i. The disability incidence rate assumption was revised to be 80% of the previous rates.
2. Senate Bill 1946, which was signed into law on April 14, 2010, as Public Act 96-0889, revised the funding provisions that had previously been in effect. Public Act 96-0889 specifies that, for Fiscal Years 2014 through 2059, the Board of Education is to make annual contributions calculated as a level percent of payroll sufficient to bring the total assets of the fund up to 90% of the total actuarial liabilities of the fund by the end of Fiscal Year 2059. Based on our projection, we have determined that the Board of Education's required contribution for Fiscal Year 2015 is \$683,574,000. In conjunction with the additional State contributions and additional Board of Education contributions of \$12,145,000 and \$12,948,000, respectively, Fiscal Year 2015 contributions will total \$708,667,000.
3. The funded ratio based on the actuarial value of assets over the actuarial accrued liability as of June 30, 2013 is 49.7%, compared to 54.1% as of June 30, 2012. This ratio is a measure of funding status; its history is a measure of funding progress.
4. For the year ended June 30, 2013, Segal has determined that the asset return on a market value basis was 13.1%. After gradual recognition of investment gains and losses under the actuarial smoothing method, the actuarial rate of return was 11.2%. This represents an experience gain when compared to the assumed rate of 8%. As of June 30, 2013, the actuarial value of assets (\$9.458 billion) represented 97.4% of the market value (\$9.710 billion).
5. The portion of deferred investment gains and losses recognized in the calculation of the June 30, 2013 actuarial value of assets resulted in a gain of \$281,738,207. Additionally, the demographic and liability experience resulted in a \$246,886,533 loss, primarily due to more retirements than expected.

SECTION 1: Valuation Summary for the Public School Teachers' Pension and Retirement Fund of Chicago

6. As mentioned above, the current method used to determine the actuarial value of assets yields an amount that is 97.4% of the market value of assets as of June 30, 2013. 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. We believe the actuarial asset method currently complies with these guidelines.
7. This actuarial valuation report as of June 30, 2013 is based on financial data as of that date. Changes in the value of assets subsequent to that date are not reflected. Declines in asset values will increase the cost of the plan, while increases in asset values (in excess of expected) will decrease the cost of the plan.

SECTION 1: Valuation Summary for the Public School Teachers' Pension and Retirement Fund of Chicago

Summary of Key Valuation Results

	July 1, 2014	July 1, 2013	July 1, 2012
Contributions for fiscal year beginning July 1:			
Required Board of Education contributions	\$683,574,000	\$600,009,000	\$196,000,000
Additional Board of Education contributions	12,948,000	12,691,000	11,654,000
Additional State contributions	<u>12,145,000</u>	<u>11,903,000</u>	<u>10,931,000</u>
Total employer contributions	708,667,000	624,603,000	218,585,000
Actual employer contributions	--	--	207,654,000
Funding elements for fiscal year beginning July 1:			
Normal cost, including administrative expenses		\$194,928,449	\$173,787,026
Market value of assets		9,709,985,467	9,471,440,984
Actuarial value of assets		9,458,316,094	9,398,201,630
Actuarial accrued liability		19,044,533,016	17,375,660,369
Unfunded/(overfunded) actuarial accrued liability		9,586,216,922	7,977,458,739
Funded ratio		49.66%	54.09%
Demographic data for plan year beginning July 1:			
Number of retirees and beneficiaries		27,440	25,926
Number of vested former participants		4,502	4,245
Number of active members		30,969	30,366
Total salary supplied by the Fund		\$2,146,811,972	\$2,118,235,482
Average salary		\$69,321	\$69,757

SECTION 2: Valuation Results for the Public School Teachers' Pension and Retirement Fund of Chicago

A. MEMBER DATA

The Actuarial Valuation and Review considers the number and demographic characteristics of covered members, including active members, inactive members, retirees, and beneficiaries.

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

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

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

CHART 1
Member Population: 2004 – 2013

Year Ended June 30	Active Members	Vested Terminated Members	Retirees and Beneficiaries	Ratio Actives to Retirees and Beneficiaries
2004	37,362	1,930	19,266	1.94
2005	37,521	2,059	20,954	1.79
2006	34,682	2,408	22,105	1.57
2007	32,968	2,752	23,623	1.40
2008	32,086	3,479	23,920	1.34
2009	31,905	3,056	24,218	1.32
2010	31,012	3,554	24,600	1.26
2011	30,133	4,253	25,199	1.20
2012	30,366	4,245	25,926	1.17
2013	30,969	4,502	27,440	1.13

SECTION 2: Valuation Results for the Public School Teachers' Pension and Retirement Fund of Chicago

B. FINANCIAL INFORMATION

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable.

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.

The chart shows the determination of the actuarial value of assets as of the valuation date.

CHART 2

Determination of Actuarial Value of Assets for Years Ended June 30, 2013 and June 30, 2012

		2013		2012	
1.	Actuarial value of assets as of prior June 30		\$9,398,201,630		\$10,140,639,494
2.	Employer and employee contributions and miscellaneous income		404,362,941		398,072,836
3.	Benefits and expenses		1,340,401,281		1,232,635,521
4.	Expected investment income		714,414,597		777,868,652
5.	Total investment income, including income for securities lending		1,174,582,823		-38,083,067
6.	Investment gain/(loss) for the year ended June 30: (5) – (4)		460,168,226		-815,951,719
7.	Expected actuarial value of assets: (1) + (2) – (3) + (4)		9,176,577,887		10,083,945,461
8.	Calculation of recognized return	Original Amount*	% Recognized	% Recognized	
(a)	Year ended June 30, 2013	\$460,168,226	25% \$115,042,057		--
(b)	Year ended June 30, 2012	-815,951,719	25% -203,987,930	25%	-\$203,987,930
(c)	Year ended June 30, 2011	1,276,986,010	25% 319,246,503	25%	319,246,503
(d)	Year ended June 30, 2010	205,750,306	25% <u>51,437,577</u>	25%	51,437,577
(e)	Year ended June 30, 2009	-3,409,759,924		25%	<u>-852,439,981</u>
(f)	Total recognized return		<u>281,738,207</u>		<u>-685,743,831</u>
9.	Total actuarial value of assets as of June 30: (7) + (8f)		\$9,458,316,094		\$9,398,201,630

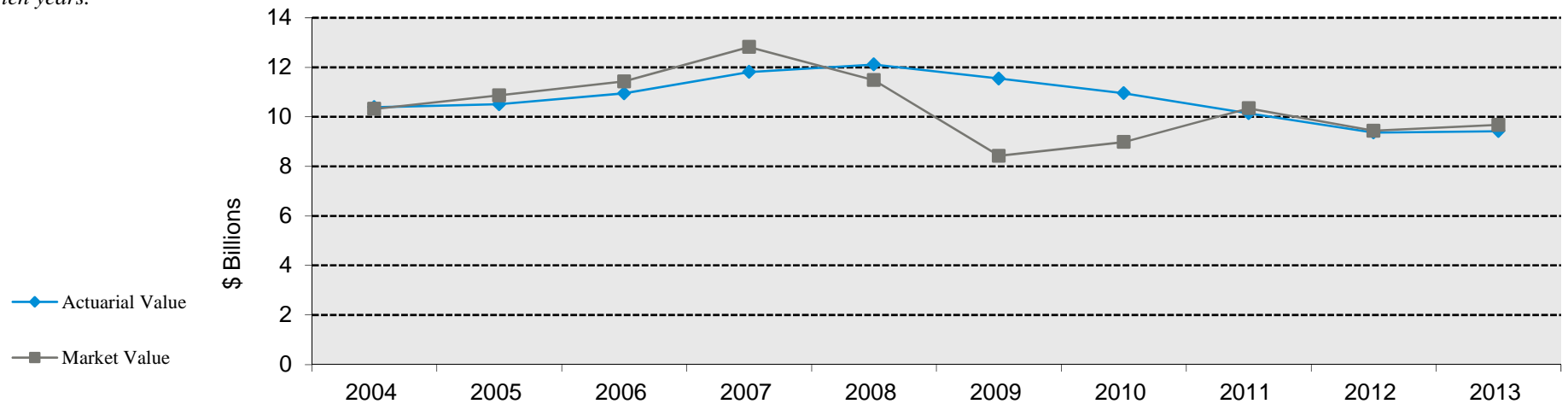
* Total return minus expected return on actuarial value

SECTION 2: Valuation Results for the Public School Teachers' Pension and Retirement Fund of Chicago

Both the actuarial value and market value of assets are representations of the Fund's 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 the Fund's 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 3
Actuarial Value of Assets vs. Market Value of Assets as of June 30, 2004 – 2013



SECTION 2: Valuation Results for the Public School Teachers' Pension and Retirement Fund of Chicago

C. ACTUARIAL EXPERIENCE

To calculate the actuarially required 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. If overall experience is more favorable than anticipated (an actuarial gain), the contribution requirement will decrease from the previous year. On the other hand, the contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's 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 net gain is \$34,851,674; \$281,738,207 from investment gains offset by \$246,886,533 in losses from all other sources. The net experience variation from individual sources other than investments was approximately 1.4% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

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

CHART 4
Actuarial Experience for Year Ended June 30, 2013

1. Net gain/(loss) from investments*	\$281,738,207
2. Net gain/(loss) from administrative expenses	-516,403
3. Net gain/(loss) from retiree health insurance cash flows	4,502,471
4. Net gain/(loss) from other experience**	<u>-250,872,601</u>
5. Net experience gain/(loss): (1) + (2) + (3)	\$34,851,674

* Details in Chart 5

** Details in Chart 8

SECTION 2: Valuation Results for the Public School Teachers' Pension and Retirement Fund of Chicago

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 CTPF's investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets for the year ending June 30, 2013 is 8.00%. The actual rate of return on an actuarial basis for the year ending June 30, 2013 was 11.15%.

Since the actual return for the year was greater than the assumed return, the CTPF experienced an actuarial gain during the year ended June 30, 2013 with regard to its investments.

This chart shows the gain/(loss) due to investment experience.

CHART 5

Actuarial Value Investment Experience for Year Ended June 30, 2013

1. Actual return	\$996,152,804
2. Average value of actuarial assets	8,930,182,460
3. Actual rate of return: (1) ÷ (2)	11.15%
4. Assumed rate of return	8.00%
5. Expected return: (2) x (4)	\$714,414,597
6. Actuarial gain/(loss): (1) – (5)	<u>\$281,738,207</u>

SECTION 2: Valuation Results for the Public School Teachers' Pension and Retirement Fund of Chicago

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 ten years, including five-year and ten-year averages.

CHART 6
Investment Return

Year Ended June 30	Market Value	Actuarial Value*
2004	15.0%	3.2%
2005	10.8%	6.0%
2006	10.7%	9.6%
2007	17.7%	13.3%
2008	-5.3%	7.9%
2009	-22.4%	0.2%
2010	13.6%	-0.4%
2011	24.8%	-0.5%
2012	-0.4%*	1.0%
2013	13.1%*	11.2%
Average Returns		
Last 5 years:	4.1%	2.0%
Last 10 years:	6.6%	5.0%

* As determined by Segal

SECTION 2: Valuation Results for the Public School Teachers' Pension and Retirement Fund of Chicago

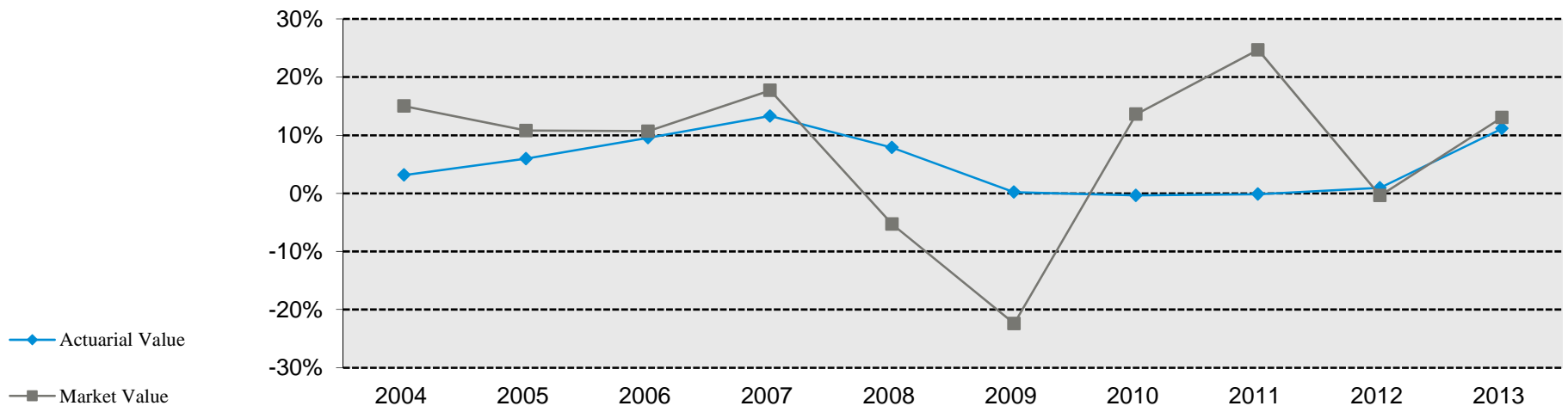
Subsection B described the actuarial asset valuation method that gradually takes into account fluctuations in the market value rate of return. The effect of this is to stabilize the actuarial rate of return, which contributes to leveling the actuarially required contribution.

Administrative Expenses

Administrative expenses for the year ended June 30, 2013 totaled \$11,537,394 compared to the assumption of \$10,626,456. This resulted in a loss of \$516,403 for the year, when adjusted for timing.

This chart illustrates how this leveling effect has actually worked over the years 2004- 2013.

CHART 7
Market and Actuarial Rates of Return for Years Ended June 30, 2004 - 2013



SECTION 2: Valuation Results for the Public School Teachers' Pension and Retirement Fund of Chicago

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:

- the extent of turnover among the participants,
- retirement experience (earlier or later than expected),
- mortality (more or fewer deaths than expected),

- the number of disability retirements, and
- salary/service increases different than assumed.

The net loss from this other experience for the year ended June 30, 2013 amounted to \$250,872,601, which is approximately 1.4% of the actuarial accrued liability.

A brief summary of the demographic gain/(loss) experience of the CTPF for the year ended June 30, 2013 is shown in the chart below.

The chart shows elements of the experience gain/(loss) for the most recent year.

CHART 8
Experience Due to Changes in Demographics for Year Ended June 30, 2013

1. Turnover	-\$2,209,156
2. Retirement	-185,542,626
3. Deaths among retired members and beneficiaries	-45,728,994
4. Salary/service increase for continuing actives	45,620,196
5. Miscellaneous*	<u>-63,012,021</u>
6. Total	-\$250,872,601

*Primarily due to retirements for inactive vested participants

SECTION 2: Valuation Results for the Public School Teachers' Pension and Retirement Fund of Chicago

D. DEVELOPMENT OF EMPLOYER COSTS

Additional State Contributions

According to Section 17-127 of the Pension Code, the State shall make additional contributions of .544% of payroll to the Fund to offset a portion of the cost of benefit increases enacted under Public Act 90-582, except that no additional contributions are required if for the previous fiscal year the ratio of the fund's assets to total actuarial liabilities was at least 90%.

Based on the June 30, 2013, actuarial valuation, the ratio of the actuarial value of assets to total actuarial liabilities, or funded ratio, amounts to 49.7%. Therefore, additional State contributions will be required for Fiscal Year 2015. The total payroll for FY 2015 is projected to be \$2,388,750,909. This total payroll includes employee contributions of 7% of salary paid by the Board of Education. Excluding these employee contributions from payroll results in an adjusted projected payroll of \$2,232,477,485. Based on this adjusted projected payroll for Fiscal Year 2015, we have determined the additional State contributions under Section 17-127 of the Pension Code to be \$12,145,000.

Additional Board of Education Contributions

According to Section 17-127.2 of the Pension Code, the Board of Education shall make additional contributions of .58% of each teacher's salary to the Fund to offset a portion of the cost of benefit increases enacted under Public Act 90-582, except that no additional contributions are required if for the previous fiscal year the ratio of the fund's assets to total actuarial liabilities was at least 90%. As the funded ratio as of June 30, 2013, is 49.7%, additional Board of Education contributions will be required for Fiscal Year 2015. Based on adjusted projected payroll of \$2,232,477,485 for Fiscal Year 2015, we have determined the additional Board of Education contribution under Section 17-127.2 of the Pension Code to be \$12,948,000.

Board of Education Required Contribution

Senate Bill 1946, which was signed into law on April 14, 2010, as Public Act 96-0889, revised the funding provisions that had previously been in effect. Public Act 96-0889 specifies that, for Fiscal Years 2014 through 2059, the Board of Education is to make annual contributions calculated as a level percent of payroll sufficient to bring the total assets of the fund up to 90% of the total actuarial liabilities of the fund by the end of Fiscal year 2059. Based on our projection, we have determined that the Board of Education's required contribution for Fiscal Year 2015 is \$683,574,000.

SECTION 3: Supplemental Information for the Public School Teachers' Pension and Retirement Fund of Chicago

EXHIBIT A

Table of Plan Coverage

Category	Year Ended June 30		Change From Prior Year
	2013	2012	
Active members in valuation:			
Number	30,969	30,366	2.0%
Average age	41.2	42.6	-3.3%
Average years of service	10.0	11.2	-10.7%
Total salary supplied by the Fund	\$2,146,811,972	\$2,118,235,482	1.3%
Average salary	\$69,321	\$69,757	-0.6%
Total active vested participants	20,185	21,063	-4.2%
Male members	7,253	7,048	2.9%
Female members	23,716	23,318	1.7%
Vested terminated members	4,502	4,245	6.1%
Service retirees:			
Number in pay status	24,042	22,636	6.2%
Average age	72.1	72.1	0.0%
Average monthly benefit	\$4,003	\$3,870	3.4%
Total annual benefit	\$1,154,757,533	\$1,051,090,534	9.9%
Disabled retirees:			
Number in pay status	478	468	2.1%
Average age	65.8	65.6	0.3%
Average monthly benefit	\$2,714	\$2,621	3.5%
Total annual benefit	\$15,565,791	\$14,717,767	5.8%
Beneficiaries (including children) in pay status:			
Number in pay status	2,920	2,822	3.5%
Average age	74.7	74.1	0.8%
Average monthly benefit	\$1,557	\$1,485	4.8%
Total annual benefit	\$54,546,193	\$50,272,587	8.5%
Total number of members*	62,911	60,537	3.9%

*There were 18,140 retirees and beneficiaries receiving health insurance subsidies as of June 30, 2013 and 17,091 as of June 30, 2012.

SECTION 3: Supplemental Information for the Public School Teachers' Pension and Retirement Fund of Chicago

EXHIBIT B

**Participants in Active Service as of June 30, 2013
By Age, Years of Service, and Average Salary**

Age	Years of Service										
	Total	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	1,287	308	978	1	--	--	--	--	--	--	--
	\$39,479	\$15,061	\$47,154	\$54,627	--	--	--	--	--	--	--
25-29	4,758	459	3,510	789	--	--	--	--	--	--	--
	50,181	17,811	51,023	65,265	--	--	--	--	--	--	--
30-34	5,488	291	2,066	2,565	566	--	--	--	--	--	--
	61,855	18,529	53,115	69,355	\$82,046	--	--	--	--	--	--
35-39	4,460	157	934	1,495	1,608	266	--	--	--	--	--
	72,481	18,106	53,826	71,344	85,867	\$95,551	--	--	--	--	--
40-44	4,098	127	625	825	1,156	1,155	210	--	--	--	--
	79,085	19,433	53,981	71,596	85,489	94,072	\$101,609	--	--	--	--
45-49	3,052	86	362	495	600	757	652	100	--	--	--
	80,576	17,908	52,387	70,738	83,787	90,856	94,556	\$96,993	--	--	--
50-54	2,797	67	245	400	452	584	554	392	102	1	--
	81,719	15,337	46,467	66,629	83,242	88,858	93,505	96,502	\$101,183	\$34,206	--
55-59	2,711	81	191	292	396	507	499	382	309	54	--
	81,758	11,873	44,142	64,356	82,356	87,055	90,454	95,140	96,837	98,314	--
60-64	1,716	45	143	187	270	321	336	221	101	57	35
	78,123	9,245	29,738	59,624	77,987	84,209	91,654	93,192	95,870	94,974	\$104,729
65-69	465	20	53	48	84	71	77	50	21	6	35
	70,062	5,796	20,675	48,425	67,862	84,190	89,834	90,422	90,403	98,793	98,154
70 & over	137	9	27	17	21	23	12	12	4	5	7
	55,882	1,397	16,696	22,696	61,948	73,190	99,947	92,881	92,265	81,351	104,659
Total	30,969	1,650	9,134	7,114	5,153	3,684	2,340	1,157	537	123	77
	\$69,321	\$16,721	\$50,748	\$68,806	\$83,817	\$90,545	\$93,521	\$95,162	\$97,195	\$95,579	\$101,734

SECTION 3: Supplemental Information for the Public School Teachers' Pension and Retirement Fund of Chicago

EXHIBIT C

Reconciliation of Participant Data

	Active Members	Vested Terminated Members	Retirees	Disabled Retirees	Beneficiaries	Total
Number as of June 30, 2012	30,366	4,245	22,636	468	2,822	60,537
New participants	3,970	N/A	N/A	N/A	N/A	3,970
Terminations	(2,181)	716	0	0	0	(1,465)
Retirements	(1,695)	(182)	1,877	N/A	N/A	0
New disabilities	(19)	(5)	N/A	24	N/A	0
Died with beneficiary	0	0	0	0	195	195
Died without beneficiary	(34)	(20)	(500)	(15)	(99)	(668)
Refunds	(123)	(61)	0	0	0	(184)
Rehire	684	(193)	0	0	N/A	491
Certain period expired	N/A	N/A	0	0	0	0
Data adjustments	<u>1</u>	<u>2</u>	<u>29</u>	<u>1</u>	<u>2</u>	<u>35</u>
Number as of June 30, 2013	30,969	4,502	24,042	478	2,920	62,911

SECTION 3: Supplemental Information for the Public School Teachers' Pension and Retirement Fund of Chicago

EXHIBIT D

Summary Statement of Income and Expenses on a Market Value Basis

	Year Ended June 30, 2013	Year Ended June 30, 2012
Net assets at market value at the beginning of the year	\$9,471,440,984	\$10,344,086,736
Contribution income:		
Employer contributions	\$207,654,000	\$203,729,011
Employee contributions	188,356,294	187,141,384
Administrative expenses	<u>-11,537,394</u>	<u>-10,120,434</u>
Net contribution income	384,472,900	380,749,961
Miscellaneous income	0	431,790
Federal insurance reimbursement	432,997	6,770,651
Insurance company reimbursement	7,919,650	0
Investment income:		
Interest, dividends and other income	\$251,110,856	\$238,788,772
Asset appreciation	961,784,065	-239,806,743
Securities lending income	4,006,659	5,011,510
Less investment and administrative fees	<u>-42,318,757</u>	<u>-42,076,606</u>
Net investment income	<u>1,174,582,823</u>	<u>-38,083,067</u>
Total income available for benefits	\$1,567,408,370	\$349,869,335
Less benefit payments:		
Annuity payments	-\$1,228,318,993	-\$1,113,884,747
Death	-3,994,308	-3,324,381
Refund of contributions	-24,787,063	-36,294,636
Refund of insurance premiums	<u>-71,763,523</u>	<u>-69,011,323</u>
Net benefit payments	-\$1,328,863,887	-\$1,222,515,087
Change in reserve for future benefits	\$238,544,483	-\$872,645,752
Net assets at market value at the end of the year	\$9,709,985,467	\$9,471,440,984

SECTION 3: Supplemental Information for the Public School Teachers' Pension and Retirement Fund of Chicago

EXHIBIT E

Summary Statement of Plan Assets

	Year Ended June 30, 2013	Year Ended June 30, 2012
Cash	\$15,666,922	\$13,428,219
Accounts receivable	203,140,399	107,762,928
Investments, at fair value:		
Equities	\$5,565,488,614	\$5,121,676,573
Fixed income	1,644,521,422	2,235,479,657
Commingled funds	1,099,569,739	0
Short-term investments	521,564,746	165,423,842
Real estate	297,996,967	727,399,447
Private equity	274,077,937	539,724,134
Infrastructure	182,573,109	304,685,721
Public REITs	175,023,120	307,980,960
Margin cash	100,000	200,000
Hedge fund	<u>0</u>	<u>173,505,261</u>
Total investments at market value	9,760,915,654	9,576,075,595
Invested securities lending collateral	648,873,113	588,095,853
Capital assets	1,934,121	2,366,332
Prepaid expenses	<u>13,174</u>	<u>12,220</u>
Total assets	\$10,630,543,383	\$10,287,741,147
Less accounts payable:		
Benefits payable	-\$3,576,691	-\$2,569,689
Refunds payable	-12,004,775	-21,757,021
Accounts and administrative expenses payable	-21,418,874	-13,516,156
Securities lending collateral	-667,849,650	-613,185,665
Due to broker for securities purchased	<u>-215,707,926</u>	<u>-165,271,632</u>
Total accounts payable	-\$920,557,916	-\$816,300,163
Net assets at market value	<u>\$9,709,985,467</u>	<u>\$9,471,440,984</u>
Net assets at actuarial value	<u>\$9,458,316,094</u>	<u>\$9,398,201,630</u>

SECTION 3: Supplemental Information for the Public School Teachers' Pension and Retirement Fund of Chicago

EXHIBIT F

Development of Unfunded Actuarial Accrued Liability

	Year Ending June 30	
	2013	2012
1. Unfunded actuarial accrued liability at beginning of year	\$7,977,458,739	\$6,799,986,951
2. Normal cost at beginning of year	364,633,862	364,247,550
3. Total contributions	396,010,294	390,870,395
4. Interest		
(a) Unfunded actuarial accrued liability and normal cost	\$667,367,408	\$573,138,760
(b) Total contributions	<u>14,318,626</u>	<u>14,132,782</u>
(c) Total interest: (4a) – (4b)	<u>653,048,782</u>	<u>559,005,978</u>
5. Expected unfunded actuarial accrued liability: (1) + (2) – (3) + (4c)	\$8,599,131,089	\$7,332,370,084
6. Changes due to (gain)/loss from:		
(a) Investments	-\$281,738,207	\$685,743,831
(b) Demographics and other	<u>246,886,533</u>	<u>28,680,271</u>
(c) Total changes due to (gain)/loss: (6a) + (6b)	-34,851,674	714,424,102
7. Change to due plan changes	0	-69,335,447*
8. Change in actuarial assumptions	<u>1,021,937,507</u>	<u>0</u>
9. Unfunded accrued liability at end of year: (5) + (6c) + (7) + (8)	<u>\$9,586,216,922</u>	<u>\$7,977,458,739</u>

*Due to pension overpayment settlement

SECTION 3: Supplemental Information for the Public School Teachers' Pension and Retirement Fund of Chicago

EXHIBIT G

Definitions of Pension Terms

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

Actuarial Accrued Liability

For Actives:

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

Actuarial Accrued Liability

For Pensioners:

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

Actuarial Cost Method:

A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the Annual Required 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., CTPF's assets earn more than projected, salary increases are less than assumed, members 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.

SECTION 3: Supplemental Information for the Public School Teachers' Pension and Retirement Fund of Chicago

Actuarially Equivalent:	Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV):	<p>The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is:</p> <ol style="list-style-type: none">Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)Multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, andDiscounted according to an assumed rate (or rates) of return to reflect the time value of money.
Actuarial Present Value of Future Plan Benefits:	<p>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 members, retired members, beneficiaries receiving benefits, and inactive members 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.</p>
Actuarial Valuation:	<p>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 Statement No. 25, such as the funded ratio and the ARC.</p>
Actuarial Value of Assets:	<p>The value of the Fund'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 ARC.</p>

SECTION 3: Supplemental Information for the Public School Teachers' Pension and Retirement Fund of Chicago

Actuarially Determined:	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.
Amortization Method:	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
Amortization Payment:	The portion of the pension plan contribution, or ARC, that is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.
Annual Required Contribution (ARC):	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under GASB Statement No. 25. The ARC consists of the Employer Normal Cost and the Amortization Payment.
Assumptions or Actuarial Assumptions:	<p>The estimates on which the cost of the Fund is calculated including:</p> <ul style="list-style-type: none">(a) <u>Investment return</u> - the rate of investment yield that the Fund will earn over the long-term future;(b) <u>Mortality rates</u> - the death rates of employees and pensioners; life expectancy is based on these rates;(c) <u>Retirement rates</u> - the rate or probability of retirement at a given age;(d) <u>Turnover rates</u> - the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement;(e) <u>Salary increase rates</u> - the rates of salary increase due to inflation and productivity growth.

SECTION 3: Supplemental Information for the Public School Teachers' Pension and Retirement Fund of Chicago

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 Funding Period and 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 Fund 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.
Funded Ratio:	The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA, although GASB 25 reporting requires the use of the AVA.
GASB:	Governmental Accounting Standards Board.
GASB 25 and GASB 27:	Governmental Accounting Standards Board Statements No. 25 and No. 27. These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement

SECTION 3: Supplemental Information for the Public School Teachers' Pension and Retirement Fund of Chicago

	No. 27 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 25 sets the rules for the systems themselves.
GASB 67 and GASB 68:	Governmental Accounting Standards Board Statements No. 67 and No. 68 are the successor statements to GASB Statements No. 25 and No. 27.
Investment Return:	The rate of earnings of the Fund from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. 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.
Margin:	The difference, whether positive or negative, between the statutory employer contribution rate and the Annual Required Contribution (ARC) as defined by GASB 25.
Normal Cost:	That portion of the Actuarial Present Value of pension plan benefits and expenses allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated.
Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount, or in relation to covered payroll, if the actuarial assumptions are realized.
Unfunded Actuarial Accrued Liability:	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.

SECTION 3: Supplemental Information for the Public School Teachers' Pension and Retirement Fund of Chicago

**Valuation Date or
Actuarial Valuation Date:**

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

SECTION 4: Reporting Information for the Public School Teachers' Pension and Retirement Fund of Chicago

EXHIBIT I

Summary of Actuarial Valuation Results

The valuation was made with respect to the following data supplied to us:

1. Pensioners as of the valuation date (including 2,920 beneficiaries and 478 disabled retirees)		27,440
2. Pensioners receiving health insurance subsidies as of the valuation date		18,140
3. Members inactive during year ended June 30, 2013 with vested rights		4,502
4. Members active during the year ended June 30, 2013		30,969
	Fully vested	20,185
	Not vested	10,784

The actuarial factors as of the valuation date are as follows:

1. Actuarial accrued liability		\$19,044,533,016
	Service retirees	\$13,331,092,731
	Disabled retirees	171,361,841
	Beneficiaries	483,031,519
	Inactive participants with vested rights	293,604,039
	Active participants:	
	Retirement	4,138,050,117
	Turnover	437,709,651
	Mortality	101,051,882
	Disability	<u>88,631,236</u>
	Total	4,765,442,886
2. Actuarial value of assets (\$9,709,985,467 at market value)		9,458,316,094
3. Unfunded actuarial accrued liability: (1) – (2)		\$9,586,216,922
4. Funded ratio: (2) ÷ (3)		49.7%

SECTION 4: Reporting Information for the Public School Teachers' Pension and Retirement Fund of Chicago

EXHIBIT I (continued)

Summary of Actuarial Valuation Results

	% of Payroll*	Amount
Components of the normal cost:		
1. Retirement	10.77%	\$250,822,405
2. Turnover	2.07%	48,102,607
3. Mortality	0.33%	7,756,890
4. Disability	<u>0.30%</u>	<u>6,942,263</u>
5. Total normal cost: (1) + (2) + (3) + (4)	13.47%	\$313,624,165
6. Health insurance reimbursement	2.79%	65,000,000
7. Administrative expenses	<u>0.52%</u>	<u>12,114,263</u>
8. Total normal cost, including administrative expenses: (5) + (6) + (7)	16.78%	\$390,738,428
9. Expected employee contributions	<u>8.41%</u>	<u>-195,809,979</u>
10. Employer normal cost: (8) + (9)	8.37%	\$194,928,449

**Based on projected payroll of \$2,327,963,064.*

SECTION 4: Reporting Information for the Public School Teachers' Pension and Retirement Fund of Chicago

EXHIBIT II

Projection of Contributions, Liabilities, and Assets

Based on the results of the June 30, 2013 actuarial valuation, we have projected valuation results for a 46-year period commencing with Fiscal Year 2014. We have based Board of Education contributions on the contribution requirements on the funding provision of Public Act 96-0889.

For purposes of the projections, all assets, contributions, and benefit payments, including amounts attributable to the retiree health insurance program, have been included. 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 46-year period from 2014 through 2059 by projecting the membership of the Fund over the 46-year period, taking into account the impact of new entrants into the Fund over the 46-year period.

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 the Fund. The assumptions regarding the profile of new entrants to the Fund were based on the recent experience of the Fund with regard to new entrants. The size of the active membership of the Fund was assumed to remain constant over the 46-year projection period. The results of our projections are shown on the following pages.

SECTION 4: Reporting Information for the Public School Teachers' Pension and Retirement Fund of Chicago

EXHIBIT II (continued)

Projection of Contributions, Liabilities, and Assets

(Board of Education contributions are based on Public Act 96-0889)
 (All dollar amounts are in millions. Actuarial Liability and asset figures as of end of year.)

<u>Fiscal Year</u>	<u>Employee Contributions</u>	<u>Required Employer Contributions</u>	<u>Additional State Contributions</u>	<u>Additional BOE Contributions</u>	<u>Required Board of Education Contributions</u>	<u>Total Actuarial Liability</u>	<u>Actuarial Value of Assets</u>	<u>Unfunded Actuarial Liability</u>	<u>Funded Ratio</u>
2014	195.8	624.6	11.9	12.7	600.0	19,546.0	9,881.5	9,664.5	50.6%
2015	200.9	708.7	12.1	12.9	683.6	20,065.9	10,085.8	9,980.1	50.3%
2016	206.6	728.7	12.5	13.3	702.9	20,605.7	10,506.5	10,099.2	51.0%
2017	212.5	749.6	12.8	13.7	723.0	21,165.1	10,838.7	10,326.5	51.2%
2018	218.5	770.9	13.2	14.1	743.6	21,745.0	11,185.4	10,559.6	51.4%
2019	224.8	793.0	13.6	14.5	764.9	22,345.4	11,551.4	10,793.9	51.7%
2020	231.1	815.6	14.0	14.9	786.8	22,966.7	11,936.0	11,030.7	52.0%
2021	237.6	838.7	14.4	15.3	809.0	23,610.2	12,342.7	11,267.5	52.3%
2022	244.0	862.2	14.8	15.8	831.7	24,277.3	12,773.5	11,503.8	52.6%
2023	250.5	886.1	15.2	16.2	854.7	24,970.7	13,231.3	11,739.3	53.0%
2024	257.0	910.6	15.6	16.6	878.4	25,689.1	13,715.9	11,973.2	53.4%
2025	263.3	935.2	16.0	17.1	902.0	26,432.6	14,227.9	12,204.7	53.8%
2026	269.6	959.5	16.4	17.5	925.5	27,201.2	14,767.8	12,433.5	54.3%
2027	275.7	983.8	16.9	18.0	948.9	27,994.9	15,335.8	12,659.1	54.8%
2028	281.8	1,008.0	17.3	18.4	972.3	28,813.0	15,932.2	12,880.8	55.3%
2029	287.9	1,032.0	17.7	18.9	995.5	29,653.7	16,556.5	13,097.2	55.8%
2030	293.8	1,055.7	18.1	19.3	1,018.3	30,515.5	17,208.1	13,307.4	56.4%
2031	299.6	1,079.0	18.5	19.7	1,040.8	31,396.2	17,886.0	13,510.2	57.0%
2032	305.3	1,102.0	18.9	20.1	1,063.0	32,294.0	18,589.4	13,704.6	57.6%
2033	311.0	1,125.0	19.3	20.6	1,085.1	33,204.9	19,316.1	13,888.7	58.2%
2034	316.6	1,147.5	19.7	21.0	1,106.9	34,125.8	20,064.7	14,061.1	58.8%
2035	322.1	1,169.8	20.0	21.4	1,128.4	35,050.9	20,831.6	14,219.4	59.4%
2036	327.4	1,191.4	20.4	21.8	1,149.2	35,974.7	21,613.0	14,361.7	60.1%

¹ Any contributions by the State of Illinois (other than the Additional State Contributions shown above) are to be credited against the Required Board of Education Contributions.

SECTION 4: Reporting Information for the Public School Teachers' Pension and Retirement Fund of Chicago

EXHIBIT II (continued)

Projection of Contributions, Liabilities, and Assets

(Board of Education contributions are based on Public Act 96-0889)
 (All dollar amounts are in millions. Actuarial Liability and asset figures as of end of year.)

<u>Fiscal Year</u>	<u>Employee Contributions</u>	<u>Required Employer Contributions</u>	<u>Additional State Contributions</u>	<u>Additional BOE Contributions</u>	<u>Required Board of Education Contributions</u> ¹	<u>Total Actuarial Liability</u>	<u>Actuarial Value of Assets</u>	<u>Unfunded Actuarial Liability</u>	<u>Funded Ratio</u>
2037	332.5	1,212.4	20.8	22.2	1,169.5	36,891.5	22,405.8	14,485.7	60.7%
2038	337.5	1,232.8	21.1	22.5	1,189.1	37,793.4	23,204.7	14,588.7	61.4%
2039	342.4	1,252.5	21.5	22.9	1,208.2	38,672.3	24,004.2	14,668.2	62.1%
2040	347.1	1,271.8	21.8	23.2	1,226.8	39,518.8	24,797.8	14,721.0	62.7%
2041	351.8	1,290.8	22.1	23.6	1,245.1	40,325.9	25,581.5	14,744.4	63.4%
2042	356.6	1,310.1	22.5	23.9	1,263.7	41,083.0	26,349.0	14,734.0	64.1%
2043	361.1	1,329.3	22.8	24.3	1,282.2	41,783.1	27,096.2	14,686.9	64.8%
2044	365.6	1,349.5	23.1	24.7	1,301.7	42,431.0	27,830.4	14,600.6	65.6%
2045	370.3	1,371.3	23.5	25.1	1,322.8	43,021.7	28,549.4	14,472.3	66.4%
2046	375.4	1,395.6	23.9	25.5	1,346.2	43,562.0	29,263.4	14,298.5	67.2%
2047	381.0	1,422.8	24.4	26.0	1,372.4	44,058.9	29,983.9	14,075.0	68.1%
2048	387.1	1,453.5	24.9	26.6	1,402.0	44,523.9	30,727.1	13,796.8	69.0%
2049	394.1	1,488.1	25.5	27.2	1,435.4	44,967.7	31,509.7	13,458.0	70.1%
2050	401.9	1,526.8	26.2	27.9	1,472.7	45,387.4	32,335.5	13,051.8	71.2%
2051	410.5	1,569.6	26.9	28.7	1,514.0	45,787.1	33,216.3	12,570.8	72.5%
2052	419.9	1,616.4	27.7	29.5	1,559.2	46,171.5	34,165.0	12,006.5	74.0%
2053	430.0	1,667.1	28.6	30.5	1,608.1	46,543.6	35,193.5	11,350.1	75.6%
2054	440.8	1,721.3	29.5	31.5	1,660.3	46,910.1	36,318.5	10,591.5	77.4%
2055	452.4	1,778.8	30.5	32.5	1,715.8	47,266.3	37,546.0	9,720.2	79.4%
2056	464.6	1,839.2	31.5	33.6	1,774.1	47,616.7	38,891.9	8,724.8	81.7%
2057	477.3	1,902.5	32.6	34.8	1,835.2	47,967.2	40,374.1	7,593.1	84.2%
2058	490.5	1,968.5	33.7	36.0	1,898.8	48,317.7	42,005.6	6,312.0	86.9%
2059	504.2	2,037.0	34.9	37.2	1,964.9	48,674.2	43,806.7	4,867.4	90.0%

¹ Any contributions by the State of Illinois (other than the Additional State Contributions shown above) are to be credited against the Required Board of Education Contributions.

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EXHIBIT III

Actuarial Assumptions and Actuarial Cost Method

Mortality Rates:

Healthy: The RP-2000 Combined Healthy Mortality Table, set back 2 years with generational improvement from 2004 using Scale AA. (adopted June 30, 2013).

Disabled: The RP-2000 Disabled Mortality Table, set back 3 years (adopted June 30, 2013).
The mortality tables specified above without future generational improvement reasonably reflect the projected mortality experience of the Fund as of the measurement date. The healthy mortality table was then adjusted to future years using additional generational improvement using Scale AA to anticipate future mortality improvement.

Termination Rates:

Select and ultimate termination rates are based on recent experience of the Fund were used (adopted June 30, 2013). Ultimate rates after the tenth year are shown for sample ages in the table on the next page. Select rates are as follows:

<u>Years of Service</u>	<u>Rate(%)</u>
Less than 1	25.0
1 - 1.99	15.0
2 - 2.99	10.0
3 - 3.99	9.0
4 - 4.99	8.0
5 - 5.99	7.0
6 - 6.99	6.0
7 - 7.99	5.0
8 - 8.99	4.5
9 - 9.99	4.0

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Age	Rate (%)
	10+ Years of Service
30	2.5
35	2.5
40	2.3
45	2.0
50	2.0
55	2.0

Retirement Rates:

For employees first hired prior to January 1, 2011, rates of retirement for each age from 55 to 75 based on the recent experience of the Fund were used (adopted June 30, 2013). Sample rates are shown below.

Age	Rate (%)	
	<34 Years of Service	34+ Years of Service
55	5.0	20.0
60	9.0	22.5
65	15.0	25.0
70	20.0	30.0
75	100.0	100.0

For employees first hired on or after January 1, 2011, rates of retirement for each age from 62 to 75 were used (adopted June 30, 2011). Sample rates are shown below.

Age	Rate (%)
62	40.0
64	25.0
67	30.0
70	20.0
75	100.0

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Disability Rates: Disability rates are based on the recent experience of the Fund were used (adopted June 30, 2013). Sample rates are shown below.

Age	Rate (%)
30	0.06
40	0.08
50	0.16
60	0.20

Salary Increases: Assumed salary increases are based on the recent experience of the Fund were used (adopted June 30, 2013). Sample rates are shown below.

Age	Rate (%)
25	10.8
30	7.3
35	7.3
40	5.8
45	5.3
50	4.8
55	4.3

Valuation of Inactive Vested Participants: The liability for an inactive member is equal to his or her existing account balance, loaded by 35%.

Unknown Data for Participants: Same as those exhibited by Participants with similar known characteristics. If not specified, Participants are assumed to be male.

Spouses: 80% of participants were assumed to be married and females are assumed to be 2 years younger than males.

Net Investment Return: 7.75% per year

Inflation: 2.75% per year

Payroll Growth: 3.50% per year

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Administrative Expenses:	Equal to actual expenses for the prior year, increased by 5%. Future expenses are assumed to grow at 5% per year.
Total Service at Retirement:	Total service at retirement is assumed to be 103.3% of the teacher's regular period of service at retirement.
Actuarial Value of Assets:	The actuarial value of assets was determined by smoothing unexpected gains and losses over a period of 4 years. The gain or loss for a year is calculated as the total investment income on the market value of assets, minus expected investment return on the prior actuarial value of assets. The final actuarial value is equal to the expected actuarial value plus (or minus) 25% of the calculated gain (or loss) in the prior 4 years.
Actuarial Cost Method:	Projected Unit Credit (adopted August 31, 1991). 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.

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Changes in Assumptions:

Investment return: 7.75% (previously, 8.00%)

Inflation rate: 2.75% (previously, 3.00%)

Payroll growth: 3.50% (previously, 4.00%)

Salary increases: Age-based ranging from 15.75% to 4.25% (previously, age-based ranging from 13.7 % to 4.0%)

Healthy mortality: RP-2000 Combined Healthy Mortality Table, set back 2 years with generational improvement from 2004 using Scale AA (previously, UP-1994 Mortality Table, set back 3 years for males and set back 2 years for females)

Disabled mortality: RP-2000 Disabled Mortality Table, set back 3 years (previously, RP-2000 Disabled Mortality Table set back 2 years for males and set forward 5 years for females)

Termination rates: 10-year service-based select table and an ultimate age-based table (previously, a 5-year service-based select table and separate age-based ultimate tables (one for at least 5 but less than 10 years of service and another for at least ten years of service))

Retirement rates: Age-based rates for less than 34 years of service and for 34 or more years of service, with revised rates to better reflect anticipated future experience (previously, age-based rates for less than 33 years of service and for 33 or more years of service)

Disability incidence: 80% of the rates in the previous table.

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EXHIBIT IV

Summary of Plan Provisions

This exhibit summarizes the major provisions of the CTPF included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Membership: Any teacher and certain other employees of the Chicago Public Schools, approved charter schools, and the Chicago Teachers' Pension Fund are members of this pension plan.

Employee Contributions: All members of the Fund are required to contribute 9% of salary to the Fund as follows: 7.5% for the retirement pension, 1% for the spouse's pension, and 0.5% for the automatic increases in the retirement pension. As of September 1981, the Board of Education has been paying 7% of the required teacher contributions for Chicago public school teachers. Charter school contributions may be contributed at various rates by the employers and teachers.

Service Retirement Pension:

a. Eligibility – An employee may retire at age 55 with at least 20 years of service or at age 62 with 5 years of service. If retirement occurs before age 60, the service retirement pension is reduced $\frac{1}{2}$ of 1% of each month that the age of the member is below 60. However, there is no reduction if the employee has at least 34 years of service.

b. Amount – For service earned before July 1, 1998, the amount of the service retirement pension is 1.67% of highest average salary for the first 10 years, 1.90% for each of the next 10 years, 2.10% for each of the following 10 years, and 2.30% for each year above 30. For service earned after June 30, 1998, the amount of the service retirement pension is 2.2% of highest average salary for each year of service.

Service earned before July 1, 1998 can be upgraded to the 2.2% formula through the payment of additional employee contributions of 1% of the teacher's highest salary

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within the last four years for each year of prior service, up to a maximum of 20%, which upgrades all service years. The number of years for which contributions are required is reduced by one for each three full years of service after June 30, 1998. No contribution is required if the employee has at least 30 years of service.

The highest average salary is the average of the 4 highest consecutive years of salary within the last 10 years.

The maximum pension payable is 75% of the highest annual salary or \$1,500 per month, whichever is greater.

An employee who first becomes a participant on or after January 1, 2011 is subject to the following provisions:

1. The highest salary for annuity purposes is equal to the average monthly salary obtained by dividing the participant's total salary during the 96 consecutive months of service within the last 120 months of service in which the total compensation was the highest by the number of months in that period.
2. For 2013, the salary is limited to \$109,971, as determined by the Illinois Department of Insurance. The limit for future years shall automatically be increased by the lesser of 3% or one-half the percentage change in the Consumer Price Index-U during the preceding calendar year.
3. A participant is eligible to retire with unreduced benefits after attainment of age 67 with at least 10 years of service credit. However, a participant may elect to retire at age 62 with at least 10 years of service credit and receive a retirement annuity reduced by $\frac{1}{2}$ of 1% for each month that the age of the member is below 67.

Post-Retirement Increase:

An annuitant is entitled to automatic annual increases of 3% of the current pension starting the later of attainment of age 61 and receipt of one year's pension payments.

Automatic annual increases in the retirement annuity for employees who first become a participant on or after January 1, 2011 is equal to the lesser of 3% or one-half the annual change in the Consumer Price Index-U, whichever is less, based on the originally granted retirement annuity. This automatic annual increase starts the later of attainment of age 67 and receipt of one year's pension payments.

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Survivor's Pension:

A surviving spouse or unmarried minor child is entitled to a pension upon the death of an employee while in service or on retirement. The minimum survivor's pension is 50% of the deceased employee's or retired employee's pension at the date of death. If the spouse is under age 50 and no unmarried minor children under age 18 survive, payment of the survivor's pension is deferred until age 50.

Survivor's pensions are subject to annual increases of 3% per year based on the current amount of pension starting the later of when the member would have attained age 61 and receipt of one year's pension payments.

For employees who first become a participant on or after January 1, 2011, the initial survivor's pension is equal to 66 $\frac{2}{3}$ % of the participant's earned retirement annuity at the date of death, subject to automatic annual increases of the lesser of 3% or one-half of the increase in the Consumer Price Index-U during the preceding calendar year, based on the originally granted survivor's annuity. This automatic annual increase starts the later of when the member would have attained age 67 and receipt of one year's pension payments.

Single Sum Death Benefit:

Upon the death of an employee in service, a refund equal to the total contributions less contributions for survivor's pensions is payable.

A death benefit is payable upon the death of an employee in service in addition to any other benefits payable to the surviving spouse or minor children. The death benefit payable is the lesser of \$10,000 and salary earned for the most recent six months.

Upon the death of a retired member, the death benefit is the lesser of \$10,000 and the most recent salary earned for a 6 month period less 20% of the death benefit for each year that the member has been on pension, to a minimum of \$5,000.

Non-Duty Disability Benefit:

A non-duty disability pension is payable in the event of total or permanent disability with 10 or more years of service. The benefit is the unreduced service retirement pension. However, if the participant has 20 or more and less than 25 years of service and is under age 55, the benefit is reduced by $\frac{1}{2}$ of 1% for each month that the age of the member is below 55 down to a minimum age of 50, but not less than the unreduced service retirement pension with 20 years of service.

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Duty Disability Benefit:	Upon disability resulting from an injury incurred while working, an employee is entitled to a disability benefit of 75% of final average salary until age 65. At age 65, the disabled employee shall receive a service retirement pension, which includes service earned while disabled.
Refunds:	<p>An employee who terminates employment before qualifying for a pension is entitled to a refund of employee contributions, without interest.</p> <p>An employee who is unmarried at date of retirement is entitled to a refund of the full amount contributed for the survivor's pension, without interest.</p>
Retiree Health Insurance:	<p>A recipient of a service retirement, disability, or survivor's pension is eligible for a partial reimbursement of the cost of health insurance coverage, which may be in the form of an annual direct payment or a reduction in the amount deducted from the monthly annuity.</p> <p>Effective January 1, 2011, the Board provides reimbursement of 60% of the cost of pensioners' health insurance coverage. The total amount of payments in any year may not exceed 75% of the total cost of health insurance coverage in that year for all recipients who receive payments in that year.</p> <p>Total payments may not exceed \$65,000,000 plus any amount that was authorized to be paid in the preceding year but was not actually paid (including any interest earned).</p>
Plan Year:	July 1 through June 30
Changes in Plan Provisions:	There have been no changes in plan provisions since the last valuation.

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