Public School Teachers' Pension and Retirement Fund of Chicago

Actuarial Valuation and Review as of June 30, 2013

Segal Consulting
101 North Wacker Drive Suite 500 Chicago, IL 60606-1724
T 312.984.8500 www.segalco.com

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 Actuarial Valuation and Review as of June 30, 2013. It summarizes the actuarial data used in the valuation, establishes the actuarially determined contribution under Governmental Accounting Standards Board (GASB) Statement No. 25 for the fiscal year ending June 30, 2014, and analyzes the preceding years' experience.

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. These actuarial assumptions and methods comply with the parameters for disclosure in GASB 25. Further, in our opinion, the assumptions as approved by the Board appear to be reasonably related to the experience of the Fund.

The funding plan currently in effect does not meet the requirements for amortizing the unfunded actuarial liability provided under GASB 25. In all other respects, the assumptions and methods used for funding purposes meet the paremeters set forth for financial statement disclosure in GASB 25.

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:

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

Matthew A. Strom, FSA, MAAA, EA
Consulting Actuary

5392098v1/13805.010

SECTION 1

VALUATION SUMMARY

SECTION 2

VALUATION RESULTS

SECTION 3

SUPPLEMENTAL INFORMATION

SECTION 4

REPORTING INFORMATION

Purpose

This report has been prepared by Segal Consulting to present a valuation of the Public School Teachers' Pension and Retirement Fund of Chicago (CTPF) as of June 30, 2013. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The actuarially determined contribution requirements 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.

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.

j. The amortization method for GASB was changed from a 30-year open period, level percentage of pay to a 30-year closed period that began July 1, 2013, level percentage of pay.

2. As shown in Chart 13, for the fiscal year beginning July 1, 2013, the actuarially determined contribution amount (the Annual Required Contribution, or ARC) is $719,781,746. Public Act 96-0889 specifies that the required Board of Education contribution for Fiscal Years 2014 through 2059 must be a level percentage of payroll sufficient to bring the funded percentage of the Fund up to 90% by the end of Fiscal Year 2059. The Fiscal Year 2014 contribution amount was determined to be $600,009,000 as a part of the June 30, 2012 valuation. Given that $65,000,000 is expected to be used to pay health insurance subsidies, the required Board of Education contribution for the pension plan is $535,009,000. Also, Sections 17-127 and 17-127.2 of the Pension Code specify additional State contributions of 0.544% of payroll and additional Board of Education Contributions of 0.58% of payroll, which were determined as part of the June 30, 2012 valuation to be $11,903,000 and $12,691,000, respectively. Therefore, the total employer contributions for Fiscal 2014 are expected to be $559,603,000. Compared to the Annual Required Contribution of $719,781,746, the contribution deficiency is $160,178,746 as of July 1, 2013. Each year there is a contribution deficiency leads to an increased deficiency in all future years.

3. The funded ratio based on the actuarial value of assets over the actuarial accrued liability as of June 30, 2013 is 49.5%, compared to 53.9% as of June 30, 2012. This ratio is a measure of funding status, its history is a measure of funding progress, and is the ratio required to be reported under GASB 25. Prior to reflecting the assumption and method changes described above, the funded ratio as of June 30, 2013 is 52.3%.

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 ($9.423 billion) represented 97.4% of the market value ($9.674 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 $284,448,947. Additionally, the demographic and liability experience resulted in a $251,389,004 loss, primarily due to more retirements than expected.
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.

Summary of Key Valuation Results

	July 1, 2013		July 1, 2012
	Before Assumption & Method Changes	After Assumption & Method Changes	
Contributions for fiscal year beginning July 1:			
Actuarially determined contribution requirement	$625,254,640	$719,781,746	$585,444,539
Expected employer contributions provided by the Fund	559,594,000	559,603,000	153,585,000
Actual employer contribution	--	--	142,654,000
Funding elements for fiscal year beginning July 1:			
Normal cost, including administrative expenses	$98,706,982	$129,928,449	$108,787,026
Market value of assets	9,674,188,563	9,674,188,563	9,437,316,026
Actuarial value of assets	9,422,519,190	9,422,519,190	9,364,076,672
Actuarial accrued liability	18,022,595,509	19,044,533,016	17,375,660,369
Unfunded/(overfunded) actuarial accrued liability	8,600,076,319	9,622,013,826	8,011,583,697
GASB 25 information for fiscal year beginning July 1:			
Annual Required Contributions (ARC)	$625,254,640	$719,781,746	$585,444,539
Actual employer contributions	--	--	142,654,000
Percentage of ARC contributed	--	--	24.37%
Funded ratio	52.28%	49.48%	53.89%
Covered payroll	--	--	$2,239,347,051
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

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

Active Members

Plan costs are affected by the age, years of service and payroll of active members. In this year's valuation, there were 30,969 active participants with an average age of 41.2, average years of service of 10.0 years and average salary of $69,321. The 30,366 active participants in the prior valuation had an average age of 42.6, average years of service of 11.2 years and average salary of $69,757.

Inactive Participants

In this year's valuation, there were 4,502 members with a vested right to a deferred or immediate vested benefit.

These graphs show a distribution of active members by age and by years of service.

CHART 2

Distribution of Active Members by Age as of June 30, 2013

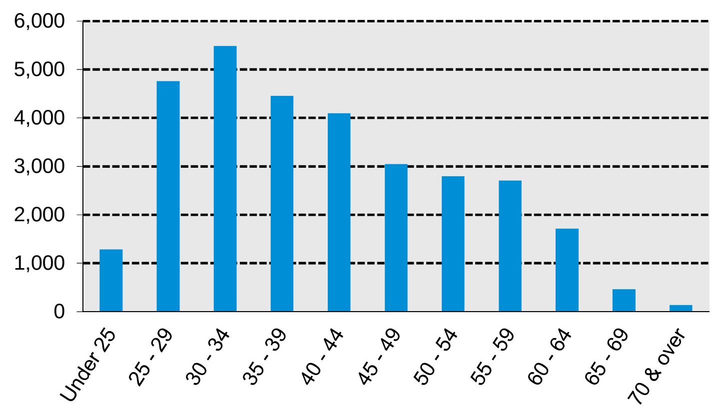
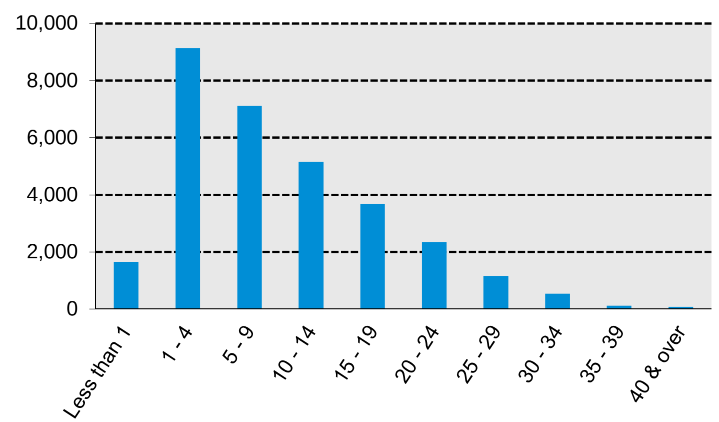


CHART 3

Distribution of Active Members by Years of Service as of June 30, 2013



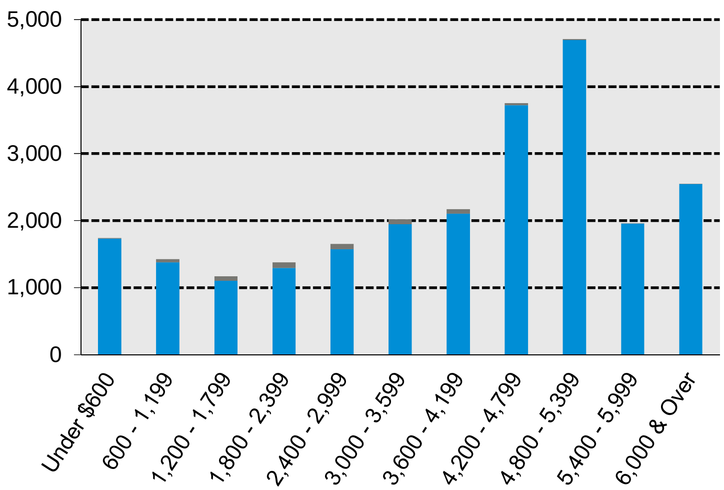
Retirees and Beneficiaries

As of June 30, 2013, 24,042 retirees, 2,920 beneficiaries, and 478 disabled retirees were receiving total monthly benefits of $102,072,460. For comparison, in the previous valuation there were 22,636 retirees, 2,822 beneficiaries, and 468 disabled retirees receiving total monthly benefits of $93,006,741.

These graphs show a distribution of the current retirees based on their monthly amount and age, by type of pension.

CHART 4

Distribution of Retirees by Monthly Amount as of June 30, 2013

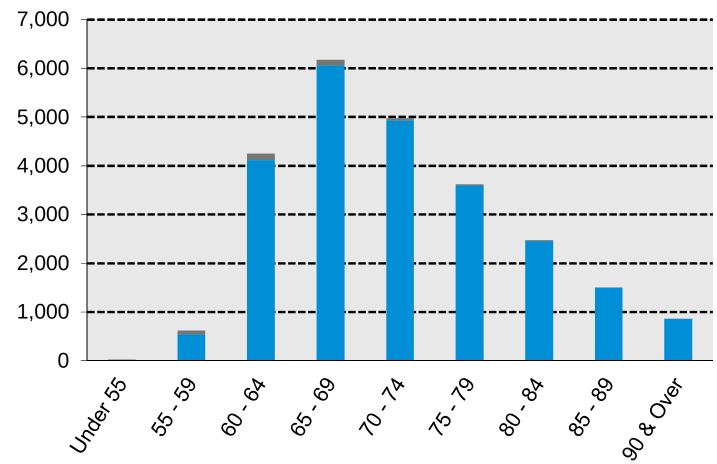


Disability

Regular

CHART 5

Distribution of Retirees by Age as of June 30, 2013



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 6

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%	51,437,577	25%	51,437,577
	(e) Year ended June 30, 2009	-3,409,759,924			25%	-852,439,981
	(f) Total recognized return			281,738,207		-685,743,831
9.	Total actuarial value of assets as of June 30: (7) + (8f)			9,458,316,094		9,398,201,630
10.	Assets for retiree health insurance benefits			35,796,904		34,124,958
11.	Actuarial value of assets for pension benefits (9) – (10)			$9,422,519,190		$9,364,076,672

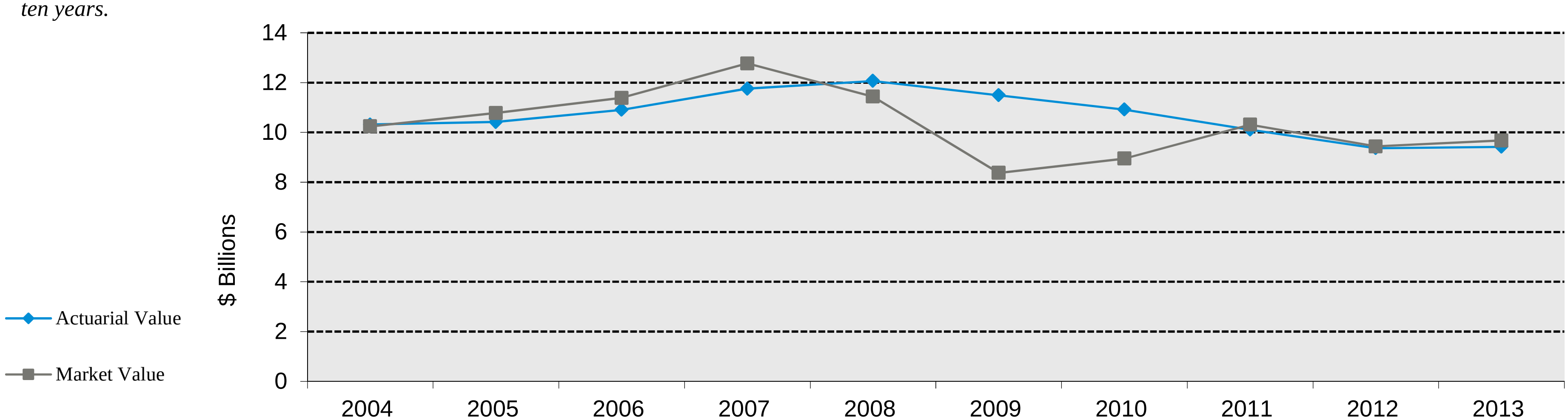
** Total return minus expected return on actuarial value*

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 7

Actuarial Value of Assets vs. Market Value of Assets as of June 30, 2004 – 2013



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 $33,059,943; $284,448,947 from investment gains offset by $251,389,004 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 8

Actuarial Experience for Year Ended June 30, 2013

1.	Net gain/(loss) from investments*	$284,448,947
2.	Net gain/(loss) from administrative expenses	-516,403
3.	Net gain/(loss) from other experience**	-250,872,601
4.	Net experience gain/(loss): (1) + (2) + (3)	$33,059,943

** Details in Chart 9*

*** Details in Chart 12*

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 11.20%.

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 9

Actuarial Value Investment Experience for Year Ended June 30, 2013

1.	Actual return	$996,069,982
2.	Average value of actuarial assets	8,895,262,940
3.	Actual rate of return: (1) ÷ (2)	11.20%
4.	Assumed rate of return	8.00%
5.	Expected return: (2) x (4)	$711,621,035
6.	Actuarial gain/(loss): (1) – (5)	$284,448,947*

*Actuarial gain/(loss) on pension assets only.

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 10
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:	6.7%	5.0%

** As determined by Segal*

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.

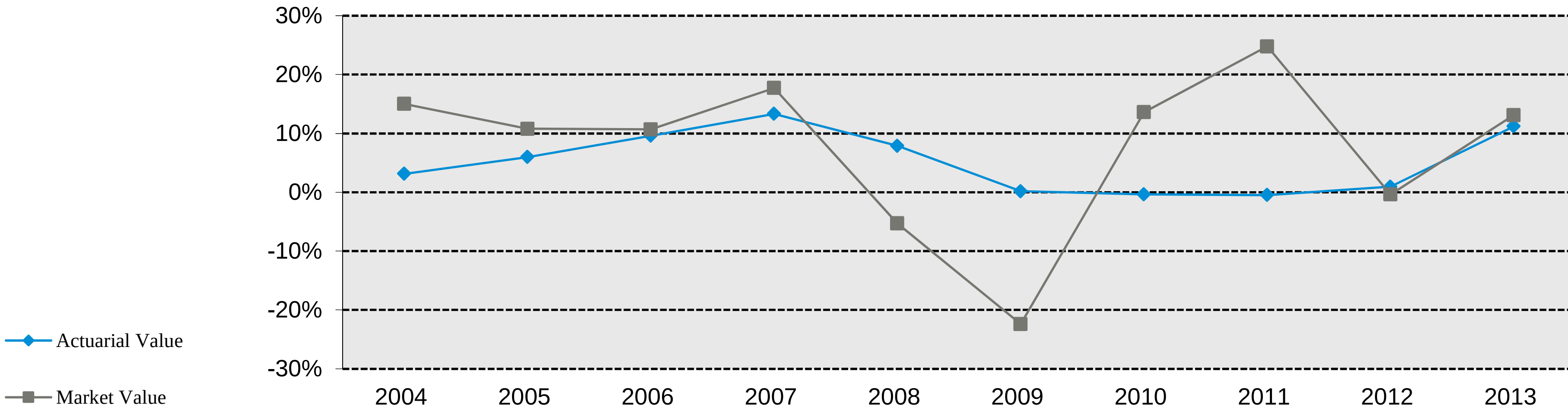
Administrative Expenses

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 11

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



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 12

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*	-63,012,021
6.	Total	-$250,872,601

*Primarily due to retirements for inactive vested participants

D. DEVELOPMENT OF EMPLOYER COSTS

The amount of Annual Required Contribution as defined by the Governmental Accounting Standards Board (GASB) is comprised of an employer normal cost payment and a payment on the unfunded actuarial accrued liability. This total amount is then divided by the projected payroll for active members to determine the Annual Required Contribution of 30.92% of payroll.

The annual required contribution is based on a closed 30-year level percentage-of-pay amortization of the unfunded actuarial accrued liability. The Board of Trustees elected to close the amortization period, effective July 1, 2013, as part of the changes from the most recent experience review.

The chart compares this valuation's actuarially determined contribution with the prior valuation.

CHART 13

Annual Required Contribution

	Year Beginning June 30			
	2013		2012	
	Amount	% of Payroll	Amount	% of Payroll
1. Total normal cost	$313,624,165	13.47%	$289,007,405	12.74%
2. Administrative expenses	12,114,263	0.52%	10,626,456	0.47%
3. Expected employee contributions	-195,809,979	-8.41%	-190,846,835	-8.41%
4. Employer normal cost: (1) + (2) + (3)	$129,928,449	5.58%	$108,787,026	4.80%
5. Employer normal cost, adjusted for timing*	134,838,147	5.79%	113,027,092	4.98%
6. Actuarial accrued liability	19,044,533,016		17,375,660,369	
7. Actuarial value of assets	9,422,519,190		9,364,076,672	
8. Unfunded actuarial accrued liability: (6) – (7)	$9,622,013,826		$8,011,583,697	
9. Payment on unfunded actuarial accrued liability, adjusted for timing*	584,943,599	25.13%	472,417,447	20.82%
10. Annual Required Contribution, adjusted for timing*: (5) + (9)	$719,781,746	30.92%	$585,444,539	25.80%
11. Projected payroll	$2,327,963,064		$2,268,956,806	

* *Recommended contributions are assumed to be paid at the middle of every month.*

The Annual Required Contribution as of July 1, 2013 is based on all of the data described in the previous sections, the actuarial assumptions described in Section 4, and the Plan provisions adopted at the time of preparation of the Actuarial Valuation. They include all changes affecting future costs, adopted benefit changes, actuarial gains and losses and changes in the actuarial assumptions.

Reconciliation of Annual Required Contribution
The chart below details the changes in the Annual Required Contribution from the prior valuation to the current year's valuation.

The chart reconciles the Annual Required Contribution from the prior valuation to the amount determined in this valuation.

CHART 14

Reconciliation of GASB Annual Required Contribution from July 1, 2012 to July 1, 2013

Annual Required Contribution as of July 1, 2012	$585,444,539
Effect of plan changes	0
Effect of expected change in amortization payment due to payroll growth	18,896,698
Effect of rolling amortization period	-9,089,298
Effect of change in administrative expense assumption	1,544,028
Effect of change in actuarial assumptions	106,378,976
Effect of contributions (more)/less than recommended contribution	27,283,387
Effect of investment (gain)/loss	-16,452,794
Effect of other gains and losses on accrued liability	14,537,568
Effect of net other changes*	-8,761,358
Total change	$134,337,207
Annual Required Contribution as of July 1, 2013	$719,781,746

*Primarily due to Tier 2 members with a lower normal cost replacing Tier 1 members with a higher normal cost

E. INFORMATION REQUIRED BY THE GASB

Governmental Accounting Standards Board (GASB) reporting information provides standardized information for comparative purposes of governmental pension plans. This information allows a reader of the financial statements to compare the funding status of one governmental plan to another on relatively equal terms.

Critical information to the GASB is the historical comparison of the GASB required contribution to the actual contributions. This comparison demonstrates whether a plan is being funded within the range of the GASB reporting requirements. Chart 15 below presents a graphical representation of this information for the Fund.

The other critical piece of information regarding the CTPF's financial status is the funded ratio. This ratio compares the actuarial value of assets to the actuarial accrued liabilities of the Fund as calculated under the GASB standards. 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.

Although the GASB requires that the actuarial value of assets be used to determine the funded ratio, Chart 16 shows the funded ratio calculated using both the actuarial value of assets and the market value of assets.

The details regarding the calculations of these values and other GASB numbers may be found in Section 4, Exhibits II, III, and IV.

These graphs show key GASB factors.

CHART 15

Required Versus Actual Employer Contributions, Years Ended June 30

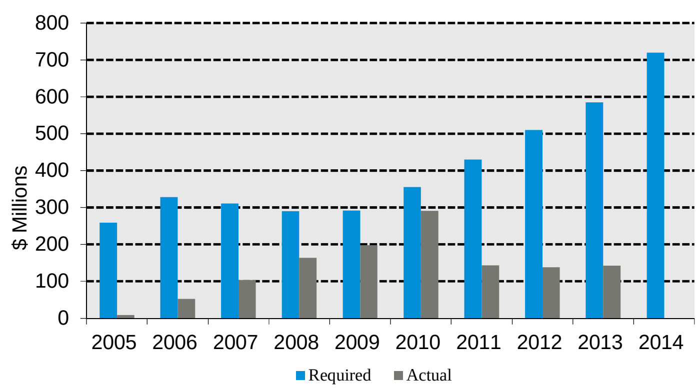


CHART 16

Funded Ratio, Years Ended June 30

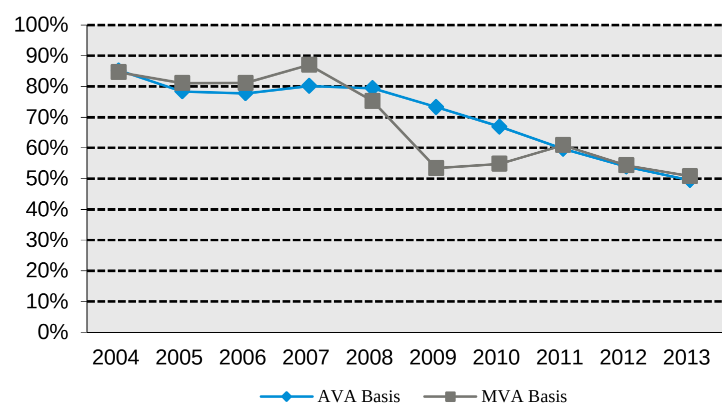


EXHIBIT A

Table of Plan Coverage

Category	Year Ended June 30 2013	Year Ended June 30 2012	Change From Prior Year
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%

EXHIBIT B

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

		Years of Service									
Age	**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

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	1	2	29	1	2	35
Number as of June 30, 2013	30,969	4,502	24,042	478	2,920	62,911

EXHIBIT D

Schedule of Retirees and Beneficiaries Added to and Removed from Rolls

	Added to Rolls		Removed from Rolls		Rolls – End of Year			
Fiscal Year	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances	Average Annual Allowances	% Increase in Avg. Annual Allowances
2003	1,363	$63,184,471	665	$20,222,042	18,565	$544,481,929	$29,328	4.5
2004	1,336	63,484,844	635	13,595,626	19,266	594,371,147	30,851	5.2
2005	2,631	117,025,483	943	23,137,112	20,954	688,259,518	32,846	6.5
2006	1,788	91,991,917	637	15,910,849	22,105	764,340,586	34,578	5.3
2007	2,055	104,043,221	537	14,063,967	23,623	854,319,840	36,165	4.6
2008	881	67,060,461	584	16,543,468	23,920	904,836,833	37,828	4.6
2009	957	57,109,256	659	19,557,718	24,218	942,388,371	38,913	2.9
2010	1,080	67,630,266	698	21,855,794	24,600	988,162,843	40,169	3.2
2011	1,394	86,404,558	795	26,694,342	25,199	1,047,873,059	41,584	3.5
2012	1,579	96,719,811	852	28,511,983	25,926	1,116,080,887	43,049	3.5
2013	2,129	130,553,477	615	21,764,846	27,440	1,224,869,518	44,638	3.7

EXHIBIT E

Distribution of Current Annuitants by Benefit Type and Amount as of June 30, 2013

	Retirees		Disabled Retirees		Beneficiaries		Total	
Monthly Pension Amount	Male	Female	Male	Female	Male	Female	Male	Female
$0 - 499	441	1,006	2	2	170	262	613	1,270
$500 - 999	392	853	11	22	235	412	638	1,287
$1,000 - 1,499	313	644	15	43	185	240	513	927
$1,500 - 1,999	249	736	14	46	189	268	452	1,050
$2,000 - 2,499	263	859	15	53	196	273	474	1,185
$2,500 - 2,999	286	1,034	15	47	77	190	378	1,271
$3,000 - 3,499	320	1,282	17	42	15	79	352	1,403
$3,500 - 3,999	363	1,312	14	45	11	52	388	1,409
$4,000 - 4,499	573	1,629	7	39	6	31	586	1,699
$4,500 - 4,999	975	2,859	5	8	2	16	982	2,883
$5,000 - 5,499	951	2,613	2	6	0	6	953	2,625
$5,500 - 5,999	396	1,150	2	1	1	0	399	1,151
$6,000 - 6,499	252	376	0	1	0	2	252	379
$6,500 - 6,999	187	280	1	1	0	0	188	281
$7,000 - 7,499	122	245	0	1	0	0	122	246
$7,500 - 7,999	103	187	1	0	1	0	105	187
$8,000 - 8,499	89	142	0	0	0	0	89	142
$8,500 - 8,999	62	118	0	0	0	1	62	119
$9,000 & over	141	239	0	0	0	0	141	239
Total	6,478	17,564	121	357	1,088	1,832	7,687	19,753

EXHIBIT F
Schedule of Average Benefit Payments

	Years of Credited Service							
	0-4	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30+**	**Total**
Fiscal Year 2012								
Average Monthly Pension	$348	$842	$1,452	$2,522	$3,308	$4,142	$5,788	$3,846
Average Final Salary	$6,690	$5,457	$5,509	$6,696	$7,049	$7,173	$7,887	$7,114
Number of Retired Members	72	114	84	134	221	157	538	1,320
Average Age								63.2
Fiscal Year 2013								
Average Monthly Pension	$275	$856	$1,645	$2,761	$3,567	$4,422	$5,976	$4,294
Average Final Salary	$5,623	$5,491	$6,180	$7,136	$7,495	$7,688	$8,157	$7,535
Number of Retired Members	56	114	91	186	380	256	824	1,907
Average Age								63.2

Table does not include disabled members or surviving spouses.

EXHIBIT G

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		$9,437,316,026		$10,312,762,164
Contribution income:				
Employer contributions	$142,654,000		$138,729,011	
Employee contributions	188,356,294		187,141,384	
Administrative expenses	-11,537,394		-10,120,434	
Net contribution income		319,472,900		315,749,961
Miscellaneous income		0		431,790
Investment income:				
Interest, dividends and other income	$251,028,034		$238,747,714	
Asset appreciation	961,784,065		-239,806,743	
Securities lending income	4,006,659		5,011,510	
Less investment and administrative fees	-42,318,757		-42,076,606	
Net investment income		1,174,500,001		-38,124,125
Total income available for benefits		$1,493,972,901		$278,057,626
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	
Net benefit payments		-$1,257,100,364		-$1,153,503,764
Change in reserve for future benefits		$236,872,537		-$875,446,138
Net assets at market value at the end of the year		$9,674,188,563		$9,437,316,026

EXHIBIT H

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	481,913,983		500,688,950	
Real estate	297,996,967		727,399,447	
Private equity	274,077,937		304,685,721	
Infrastructure	182,573,109		307,980,960	
Public REITs	175,023,120		165,423,842	
Margin cash	100,000		200,000	
Hedge fund	0		173,505,261	
Total investments at market value		9,721,264,891		9,537,040,411
Invested securities lending collateral		648,873,113		588,095,853
Capital assets		1,934,121		2,366,332
Prepaid expenses		13,174		12,220
Total assets		$10,590,892,620		$10,248,705,963
Less accounts payable:				
Benefits payable	-$3,576,691		-$2,569,689	
Refunds payable	-12,004,775		-21,757,021	
Accounts and administrative expenses payable	-17,565,015		-8,605,930	
Securities lending collateral	-667,849,650		-613,185,665	
Due to broker for securities purchased	-215,707,926		-165,271,632	
Total accounts payable		-$916,704,057		-$811,389,937
Net assets at market value		$9,674,188,563		$9,437,316,026
Net assets at actuarial value		$9,422,519,190		$9,364,076,672

EXHIBIT I

Development of the Fund Through June 30, 2013

Year Ended June 30	Employer Contributions	Employee Contributions	Net Investment Return*	Miscellaneous	Administrative Expenses	Benefit Payments	Actuarial Value of Assets at End of Year
2004	$13,032,273	$169,598,212	$321,457,265	$86,285	$7,214,467	$612,438,269	$10,314,963,645
2005	8,872,764	175,706,081	603,213,991	561,154	7,477,671	679,131,878	10,416,708,086
2006	52,789,706	163,419,386	1,033,995,851**	139,509	8,320,340	751,791,350	10,906,940,848
2007	103,761,750	179,017,663	1,415,420,214	1,923	8,434,688	837,008,647	11,759,699,063
2008	164,270,412	172,504,804	905,021,878	0	7,827,576	924,251,543	12,069,417,038
2009	198,069,327	176,176,975	21,935,841	0	8,751,945	963,591,482	11,493,255,754
2010	290,759,950	194,621,551	-39,885,503	0	8,800,848	1,012,533,911	10,917,416,993
2011	143,589,994	185,882,636	-50,121,733	55,307	9,527,938	1,077,980,337	10,109,314,922
2012	138,729,011	187,141,384	92,083,763	431,790	10,120,434	1,153,503,764	9,364,076,672
2013	142,654,000	188,356,294	996,069,982	0	11,537,394	1,257,100,364	9,422,519,190

* *Net of investment fees*

** *Includes $59,496,735 transferred from health insurance assets*

EXHIBIT J

Development of Unfunded Actuarial Accrued Liability

	Year Ending June 30			
	2013		2012	
1. Unfunded actuarial accrued liability at beginning of year		$8,011,583,697		$6,831,311,523
2. Normal cost at beginning of year		299,633,862		299,247,550
3. Total contributions		331,010,294		325,870,395
4. Interest				
(a) Unfunded actuarial accrued liability and normal cost	$664,897,405		$570,444,726	
(b) Total contributions	11,968,408		11,782,564	
(c) Total interest: (4a) – (4b)		652,928,997		558,662,162
5. Expected unfunded actuarial accrued liability: (1) + (2) – (3) + (4c)		$8,633,136,262		$7,363,350,840
6. Changes due to (gain)/loss from:				
(a) Investments	-$284,448,947		$683,168,550	
(b) Demographics and other	251,389,004		34,399,754	
(c) Total changes due to (gain)/loss: (6a) + (6b)		-33,059,943		717,568,304
7. Change to due plan changes		0		-69,335,447*
8. Change in actuarial assumptions		1,021,937,507		0
9. Unfunded accrued liability at end of year: (5) + (6c) + (7) + (8)		$9,622,013,826		$8,011,583,697

**Due to pension overpayment settlement*

EXHIBIT K
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.

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): 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:

a. Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)
b. 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
c. Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Plan Benefits: The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active 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.

Actuarial Valuation: The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB Statement No. 25, such as the funded ratio and the ARC.

Actuarial Value of Assets: 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.

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

(a) Investment return - the rate of investment yield that the Fund 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 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

	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.

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.

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.	Members inactive during year ended June 30, 2013 with vested rights		4,502
3.	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	88,631,236	
	Total	4,765,442,886	
2.	Actuarial value of assets ($9,674,188,563 at market value)		9,422,519,190
3.	Unfunded actuarial accrued liability: (1) – (2)		$9,622,013,826
4.	Funded ratio: (2) ÷ (3)		49.5%

EXHIBIT I (continued)

Summary of Actuarial Valuation Results

Components of the normal cost:	% of Payroll	Amount
1. Retirement	10.77%	$250,822,405
2. Turnover	2.07%	48,102,607
3. Mortality	0.33%	7,756,890
4. Disability	0.30%	6,942,263
5. Total normal cost: (1) + (2) + (3) + (4)	13.47%	$313,624,165
6. Administrative expenses	0.52%	12,114,263
7. Total normal cost, including administrative expenses: (5) + (6)	13.99%	$325,738,428
8. Expected employee contributions	-8.41%	-195,809,979
9. Employer normal cost: (7) + (8)	5.58%	$129,928,449

The determination of the Annual Required Contribution (GASB 25) is as follows:	
1. Total normal cost	$313,624,165
2. Administrative expenses	12,114,263
3. Expected employee contributions	-195,809,979
4. Employer normal cost: (1) + (2) + (3)	$129,928,449
5. Employer normal cost projected, adjusted for timing*	134,838,147
6. Payment on projected unfunded/(overfunded) actuarial accrued liability, adjusted for timing*	584,943,599
7. Total Annual Required Contribution: (5) + (6)	$719,781,746
8. Expected employer contributions	$559,603,000
9. Projected payroll	$2,327,963,064
10. Total Annual Required Contribution as a percentage of projected payroll: (7) ÷ (9)	30.92%

**Recommended contributions are assumed to be paid at the middle of every month.*

EXHIBIT II

Schedule of Employer Contributions

Plan Year Ended June 30	Annual Required Contributions	Actual Contributions	Percentage Contributed
2004	$202,971,485	$13,032,273	6.42%
2005	258,883,211	8,872,764	3.43%
2006	328,365,821	52,789,706	16.08%
2007	311,139,800	103,761,750	33.35%
2008	290,072,885	164,270,412	56.63%
2009	292,145,359	198,069,327	67.80%
2010	355,846,125	290,759,950	81.71%
2011	430,091,545	143,589,994	33.39%
2012	510,101,466	138,729,011	27.20%
2013	585,444,539	142,654,000	24.37%

EXHIBIT III

Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded/ (Overfunded) AAL (UAAL) (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll* [(b) - (a)] / (c)
06/30/2004	10,392,193,115**	12,105,680,577	1,713,487,462	85.85%	1,767,631,306	96.9%
06/30/2005	10,506,471,213**	13,295,876,206	2,789,404,993	79.02%	1,968,612,235	141.7%
06/30/2006	10,947,998,433**	14,035,627,452	3,087,629,019	78.00%	1,944,358,215	158.8%
06/30/2007	11,759,699,063	14,677,184,345	2,917,485,282	80.12%	1,863,182,086	156.6%
06/30/2008	12,069,417,038	15,203,740,567	3,134,323,529	79.38%	1,914,558,916	163.7%
06/30/2009	11,493,255,754	15,683,241,527	4,189,985,773	73.28%	1,996,194,224	209.9%
06/30/2010	10,917,416,993	16,319,743,665	5,402,326,672	66.90%	2,107,934,080	256.3%
06/30/2011	10,109,314,922	16,940,626,445	6,831,311,523	59.67%	2,090,131,858	326.8%
06/30/2012	9,364,076,672	17,375,660,369	8,011,583,697	53.89%	2,224,903,121	360.1%
06/30/2013	9,422,519,190	19,044,533,016	9,622,013,826	49.48%	2,239,347,051	429.7%

* *Not less than zero*

** *Includes Health Insurance Fund assets*

EXHIBIT IV

Solvency Test

	June 30, 2013	June 30, 2012
1. Actuarial accrued liability (AAL)		
a. Active member contributions	$1,463,781,268	$1,538,160,937
b. Retirees and beneficiaries	13,985,486,091	12,320,263,633
c. Active and inactive members (employer financed)	3,595,265,657	3,517,235,799
d. Total	$19,044,533,016	$17,375,660,369
2. Actuarial value of assets	9,422,519,190	9,364,076,672
3. Cumulative portion of AAL covered		
a. Active member contribution	100.0%	100.0%
b. Retirees and beneficiaries	56.9%	63.5%
c. Active and inactive members (employer financed)	0.0%	0.0%

EXHIBIT V

Supplementary Information Required by the GASB

Valuation date	June 30, 2013
Actuarial cost method	Projected unit credit cost method
Amortization method	Level percent of payroll
Amortization period	30 years (closed period)
Asset valuation method	4-year smoothed market value
Actuarial assumptions:	
Investment rate of return	7.75%
Inflation rate	2.75%
Payroll growth	3.50%
Projected salary increases	Age-based ranging from 15.75% to 4.25%
Cost of living adjustments	3% compound for Tier 1 retirees; the lesser of 3% or one-half CPI, simple, for Tier 2 retirees
Plan membership:	
Retirees and beneficiaries receiving benefits	27,440
Terminated members entitled to, but not yet receiving benefits	4,502
Active members	30,969
Total	62,911

EXHIBIT VI
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:

Years of Service	Rate(%)
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

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.

	Rate (%)	
Age	<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

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 female.

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

Administrative Expenses:	Equal to actual expenses for the prior year, increased by 5%.
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.

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.

EXHIBIT VII

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 ½ 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

	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 ½ 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.

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 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 ½ 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.

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:	An employee who terminates employment before qualifying for a pension is entitled to a refund of employee contributions, without interest. 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.
Plan Year:	July 1 through June 30
Changes in Plan Provisions:	There have been no changes in plan provisions since the last valuation.

This page intentionally left blank

Public School Teachers' Pension and Retirement Fund of Chicago

Statutorily Required Funding Valuation as of June 30, 2013

Segal Consulting

Segal Consulting

101 North Wacker Drive Suite 500 Chicago, IL 60606-1724
T 312.984.8500 www.segalco.com

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: Kim Nicholl

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

Matthew A. Strom

Matthew A. Strom, FSA, MAAA, EA
Consulting Actuary

5393680v1/13805.010

SECTION 1

VALUATION SUMMARY

SECTION 2

VALUATION RESULTS

SECTION 3

SUPPLEMENTAL INFORMATION

SECTION 4

REPORTING INFORMATION

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.

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.

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.

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	12,145,000	11,903,000	10,931,000
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

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

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%	51,437,577	25%	51,437,577
	(e) Year ended June 30, 2009	-3,409,759,924			25%	-852,439,981
	(f) Total recognized return			281,738,207		-685,743,831
9.	Total actuarial value of assets as of June 30: (7) + (8f)			$9,458,316,094		$9,398,201,630

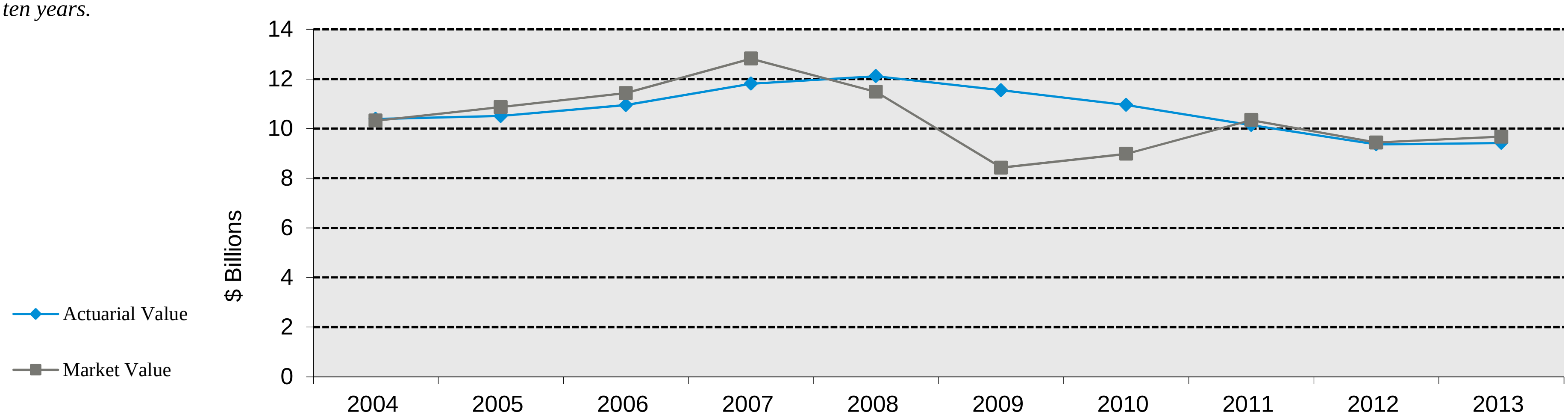
* *Total return minus expected return on actuarial value*

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



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**	-250,872,601
5.	Net experience gain/(loss): (1) + (2) + (3)	$34,851,674

** Details in Chart 5*

*** Details in Chart 8*

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)	$281,738,207

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*

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.

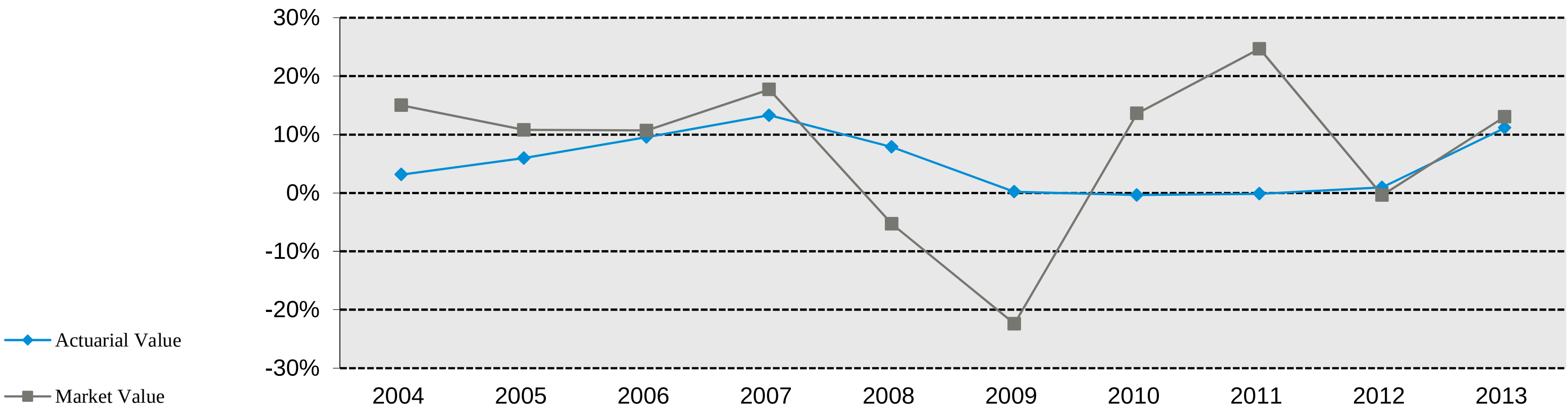
Administrative Expenses

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



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*	-63,012,021
6.	Total	-$250,872,601

*Primarily due to retirements for inactive vested participants

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.

EXHIBIT A

Table of Plan Coverage

Category	Year Ended June 30 2013	Year Ended June 30 2012	Change From Prior Year
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.

EXHIBIT B

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

		Years of Service									
Age	**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

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	1	2	29	1	2	35
Number as of June 30, 2013	30,969	4,502	24,042	478	2,920	62,911

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	-11,537,394		-10,120,434	
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	-42,318,757		-42,076,606	
Net investment income		1,174,582,823		-38,083,067
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	-71,763,523		-69,011,323	
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

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	0		173,505,261	
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		13,174		12,220
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	-215,707,926		-165,271,632	
Total accounts payable		-$920,557,916		-$816,300,163
Net assets at market value		$9,709,985,467		$9,471,440,984
Net assets at actuarial value		$9,458,316,094		$9,398,201,630

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	14,318,626		14,132,782	
(c) Total interest: (4a) – (4b)		653,048,782		559,005,978
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	246,886,533		28,680,271	
(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		1,021,937,507		0
9. Unfunded accrued liability at end of year: (5) + (6c) + (7) + (8)		$9,586,216,922		$7,977,458,739

**Due to pension overpayment settlement*

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.

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): 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:

a. Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)
b. 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
c. Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Plan Benefits: The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active 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.

Actuarial Valuation: The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB Statement No. 25, such as the funded ratio and the ARC.

Actuarial Value of Assets: 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.

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

(a) Investment return - the rate of investment yield that the Fund 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 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

	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.

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.

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	88,631,236	
	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%

EXHIBIT I (continued)

Summary of Actuarial Valuation Results

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

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

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.

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.)

Fiscal Year	Employee Contributions	Required Employer Contributions	Additional State Contributions	Additional BOE Contributions	Required Board of Education Contributions[1]	Total Actuarial Liability	Actuarial Value of Assets	Unfunded Actuarial Liability	Funded Ratio
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.

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.)

Fiscal Year	Employee Contributions	Required Employer Contributions	Additional State Contributions	Additional BOE Contributions	Required Board of Education Contributions[1]	Total Actuarial Liability	Actuarial Value of Assets	Unfunded Actuarial Liability	Funded Ratio
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.

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:

Years of Service	Rate(%)
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

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.

	Rate (%)	
Age	<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

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

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.

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.

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 ½ 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

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 ½ 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.

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 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 ½ 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.

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:	An employee who terminates employment before qualifying for a pension is entitled to a refund of employee contributions, without interest. 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.
Retiree Health Insurance:	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. 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. 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).
Plan Year:	July 1 through June 30
Changes in Plan Provisions:	There have been no changes in plan provisions since the last valuation.

This page intentionally left blank

Public School Teachers' Pension and Retirement Fund of Chicago

Actuarial Valuation and Review of Other Postemployment Benefits (OPEB) as of June 30, 2013 In Accordance with GASB Statement No. 43

This report has been prepared at the request of the Board of Trustees to assist in administering the Fund. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Board of Trustees and may only be provided to other parties in its entirety. The measurements shown in this actuarial valuation may not be applicable for other purposes.

Segal Consulting

101 North Wacker Drive, Suite 500 Chicago, IL 60606
T 312.984.8500 F 312.984.8590 www.segalco.com

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 report on our actuarial valuation of postemployment welfare benefits as of June 30, 2013 under GASB Statement Number 43. It establishes the liabilities of the other postemployment benefits in accordance with GASB Statement Number 43 and summarizes the actuarial data.

This report is based on information received from Fund Staff. The actuarial projections were based on the assumptions and methods described in Exhibit I and on the plan of benefits as summarized in Exhibit II.

We look forward to discussing this material with you at your convenience.

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By:

Kim Nicholl, FSA, MAAA, EA, FCA	*Matthew A. Strom, FSA, MAAA, EA*
Senior Vice President and Actuary	*Consulting Actuary*

SECTION 1

EXECUTIVE SUMMARY

SECTION 2

VALUATION RESULTS

SECTION 3

VALUATION DETAILS

SECTION 4

SUPPORTING INFORMATION

PURPOSE

This report presents the results of our actuarial valuation of the Public School Teachers' Pension and Retirement Fund of Chicago as of June 30, 2013 to be used for the fiscal year ending June 30, 2014. The results are in accordance with Governmental Accounting Standards, which prescribe an accrual methodology for accumulating the value of other postemployment benefits (OPEB) over participants' active working lifetimes.

HIGHLIGHTS OF THE VALUATION

- The following assumption and method changes were approved by the Board of Trustees and are reflected in this valuation:

  a. Assumed rates of enrollment were decreased.

  b. Mortality, disability, turnover, and retirement rates were modified.

  c. The payroll growth rate was lowered from 4.00% to 3.50%.

  d. The amortization method for GASB was changed from a 30-year open period, level percentage of pay to a 30-year closed period, level percentage of pay.

  In addition, valuation-year per capita health costs were updated based on recent data.

- The Unfunded Actuarial Accrued Liability (UAAL) is $2.35 billion as of June 30, 2013, compared to $3.08 billion the prior year.

- The Annual Required Contribution (ARC) is $165.1 million as of July 1, 2013; the ARC was $216.2 million as of July 1, 2012.

- $65 million was contributed towards postretirement medical benefits in the year ending June 30, 2013.

The plan complies with the Patient Protection and Affordable Care Act (PPACA) and the Health Care and Education Reconciliation Act (HCERA) as of the valuation date. This valuation includes the effect of the excise tax beginning in 2018. The effect on the obligation of any other future aspects of the Acts is assumed to be *de minimis.*

December 13, 2013

ACTUARIAL CERTIFICATION

This is to certify that Segal Consulting, a Member of The Segal Group, Inc. ("Segal"), has conducted an actuarial valuation of certain benefit obligations of the Public School Teachers' Pension and Retirement Fund of Chicago's other postemployment benefit programs as of June 30, 2013, in accordance with generally accepted actuarial principles and practices. The actuarial calculations presented in this report have been made on a basis consistent with our understanding of GASB requirements for the determination of the liability for postemployment benefits other than pensions.

The actuarial valuation is based on the plan of benefits and reliance on participant data and premiums provided by the Fund. Segal does not audit the data provided. The accuracy and comprehensiveness of the data is the responsibility of those supplying the data. Segal, however, does review the data for reasonableness and consistency. Based on our review of the data, we have no reason to doubt the substantial accuracy of the information on which we have based this report and we have no reason to believe there are facts or circumstances that would affect the validity of these results.

The actuarial computations made are for purposes of fulfilling plan accounting requirements. Determinations for purposes other than meeting financial accounting requirements may be significantly different from the results reported here. Accordingly, additional determinations may be needed for other purposes, such as judging benefit security at termination of the plan, or determining short-term cash flow requirements.

The signing actuaries are members of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, this report is complete and accurate and in our opinion presents the information necessary to comply with GASB requirements with respect to the benefit obligations addressed.

Barbara Zaveduk

Barbara Zaveduk, EA, MAAA
Vice President and Actuary

Yori Rubinson

Yori Rubinson, FSA, MAAA
Retiree Health Actuary

EXHIBIT A

Summary of Participant Data

	June 30, 2013	June 30, 2012
Retirees and Beneficiaries		
Number currently receiving health benefits	18,140	17,091
Average age	73.1	72.7
Number entitled to health benefits but not currently receiving them	9,300	8,835
Terminated employees who may be entitled to future benefits		
Number	4,502	4,245
Average age	48.0	48.5
Active Participants		
Number	30,969	30,366
Average age	41.2	42.6
Average years of service	10.0	11.2

EXHIBIT B

Actuarial Accrued Liability (AAL) and Unfunded AAL (UAAL)

Participant Category	June 30, 2013	June 30, 2012
Current retirees and beneficiaries	$1,350,519,247	$1,516,900,072
Terminated employees who may be entitled to future benefits	29,155,744	85,062,764
Current active members	1,006,430,936	1,508,353,427
Total actuarial accrued liability (AAL)	$2,386,105,927	$3,110,316,263
Effect of Assets		
Employer actuarial accrued liability (AAL)	$2,386,105,927	$3,110,316,263
Actuarial value of assets	35,796,904	34,124,958
Unfunded actuarial accrued liability (UAAL)	$2,350,309,023	$3,076,191,305

CHART 1

Summary of Required Supplementary Information

Valuation date	June 30, 2013
Actuarial cost method	Projected Unit Credit
Amortization method	Level percent of payroll
Amortization period	30 years (closed period)
Asset valuation method	Market
Actuarial assumptions:	
Discount rate	4.50%
Inflation	3.50%
Heath care cost trend rate:	8.0% graded to 5% over 6 years
Plan membership:	
Current retirees and beneficiaries currently receiving health benefits	18,140
Retirees and beneficiaries entitled to health benefits but not currently receiving them	9,300
Terminated employees who may be entitled to future benefits	4,502
Current active members	30,969
Total	62,911

CHART 2

Determination of Annual Required Contribution (ARC)

		July 1, 2013		July 1, 2012	
	Cost Element	Amount	% of Payroll	Amount	% of Payroll
1.	Normal cost	$75,361,817	3.24%	$106,333,213	4.78%
2.	Amortization of the unfunded actuarial accrued liability (30 years)	89,753,586	3.85%	109,829,935	4.94%
3.	Total Annual Required Contribution (ARC)	$165,115,403	7.09%	$216,163,148	9.72%
4.	Projected Payroll	$2,327,963,064		$2,224,903,121	

CHART 3

Required Supplementary Information – Schedule of Employer Contributions

Fiscal Year Ending	Annual Required Contributions (ARC)	Actual Contributions	Percentage Contributed
June 30, 2007	$209,446,107	$65,000,000	31.03%
June 30, 2008	150,033,070	65,000,000	43.32%
June 30, 2009	171,880,428	65,000,000	37.82%
June 30, 2010	186,231,574	65,000,000	34.90%
June 30, 2011	215,797,617	65,000,000	30.12%
June 30, 2012	218,842,221	65,000,000	29.70%
June 30, 2013	216,163,148	65,000,000	30.07%

CHART 4

Required Supplementary Information – Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	[Assets as a % of Actuarial Liability] Funded Ratio (c) = (a) / (b)	Unfunded AAL (UAAL) (d) = (b) - (a)	Active Member Payroll (e)	UUAL as a % of Active Member Payroll (f) = (d)/(e)
June 30, 2006	$41,057,585	$2,373,773,770	1.73%	$2,332,716,185	$1,944,358,215	119.97%
June 30, 2007	47,401,758	2,022,007,643	2.34%	1,974,605,885	1,863,182,086	105.98%
June 30, 2008	44,989,385	2,407,122,492	1.87%	2,362,133,107	1,914,558,916	123.38%
June 30, 2009	49,691,750	2,670,282,662	1.86%	2,620,590,912	1,996,194,224	131.28%
June 30, 2010	34,857,732	2,864,877,305	1.22%	2,830,019,573	2,107,934,080	134.26%
June 30, 2011	31,324,572	3,071,516,739	1.02%	3,040,192,167	2,090,131,858	145.45%
June 30, 2012	34,124,958	3,110,316,263	1.10%	3,076,191,305	2,224,903,121	138.26%
June 30, 2013	35,796,904	2,386,105,927	1.50%	2,350,309,023	2,239,347,051	104.96%

Chart 5

Solvency Test

	June 30, 2013	June 30, 2012
1. Actuarial accrued liability (AAL)		
a. Active member contributions	$0	$0
b. Retirees and beneficiaries	1,350,519,247	1,516,900,072
c. Active and inactive members (employer financed)	1,035,586,680	1,593,416,191
d. Total	$2,386,105,927	$3,110,316,263
2. Actuarial value of assets	35,796,904	34,124,958
3. Cumulative portion of AAL covered		
a. Active member contribution	100.0%	100.0%
b. Retirees and beneficiaries	2.65%	2.25%
c. Active and inactive members (employer financed)	0.00%	0.00%

EXHIBIT I

Actuarial Assumptions and Actuarial Cost Method

Measurement Date:	June 30, 2013
Discount Rate:	4.50%
Payroll Growth:	3.50% per year
Actuarial Cost Method:	Projected Unit Credit
Asset Valuation Method:	Market value
Data:	Detailed census data and financial data for postemployment benefits were provided by the Fund staff.
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). Select rates are as follows:

Years of Service	Rate (%)
Less than 1	25.00
1 - 1.99	15.00
2 - 2.99	10.00
3 - 3.99	9.00
4 - 4.99	8.00
5 - 5.99	7.00
6 - 6.99	6.00
7 - 7.99	5.00
8 - 8.99	4.50
9 - 9.99	4.00

Ultimate rates after the tenth year for sample ages are as follows:

10+ Years of Service	
Age	Rate (%)
30	2.50
35	2.50
40	2.25
45	2.00
50	2.00
55	2.00

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

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.

	Rate (%)	
Age	**<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

Terminated Employees:

Of current and future terminated participants with 10 or more years of service, 15% were assumed to meet eligibility requirements and elect coverage (adopted June 30, 2013). Terminated participants with less than 10 years of service were assumed not to participate. Terminated employees first hired prior to January 1, 2011 were assumed to retire at age 60 with 20 or more years of service, or at age 62. Terminated employees first hired on or after January 1, 2011 were assumed to retire at age 65 (adopted June 30, 2012).

Participation and Coverage Election:	75% of future female retirees under age 65 and 60% of future male retirees under age 65 were assumed to participate. 80% of future female retirees age 65 and greater and 65% of future male retirees age 65 and greater were assumed to participate. This participation assumption was also applied to retirees currently receiving COBRA reimbursement. Of current retirees under age 65 who are not currently participating, 20% of females and 12.5% of males were assumed to participate at age 65 (adopted June 30, 2013).
Missing Participant Data:	A missing census item for a given participant was assumed to equal the average value of that item over all other participants of the same status for whom the item is known.
Dependents:	Demographic data was available for spouses of current retirees. For future retirees, 80% of participants are assumed to be married, with husbands two years older than their wives. Upon the death of the retiree, 20% of surviving spouses are assumed to elect coverage (adopted June 30, 2013).
Per Capita Cost Development:	Per capita claims costs were based on the average retiree premiums and Part A and B reimbursements as of January 1, 2013, and average rebates paid in year ended June 30, 2013 (largely incurred in calendar year 2011). Averages were calculated separately for retirees under and over age 65. The averages were trended to the midpoint of the valuation year at assumed trend rates. Actuarial factors were then applied to the average cost to estimate individual retiree and spouse costs by age and by gender.

Per Capita Health Costs: Average claims for the plan year beginning July 1, 2013 are shown in the table below for retirees at selected ages. Costs shown are total costs; plan pays 60%.

	Retiree		Spouse	
Age	**Male**	**Female**	**Male**	**Female**
55	$11,367	$11,736	$8,946	$10,133
60	13,500	12,650	11,977	11,752
64	15,488	13,420	15,119	13,227
65	5,266	4,476	5,266	4,476
70	6,103	4,824	6,103	4,824
75	6,577	5,192	6,577	5,192

Health Care Cost Trend Rates: Health care trend measures the anticipated overall rate at which health plan costs are expected to increase in future years.

Year Ending June 30	Rate (%)
2014	8.0
2015	7.5
2016	7.0
2017	6.5
2018	6.0
2019	5.5
2020 & Later	5.0

Plan Design:	Development of plan liabilities was based on the substantive plan of benefits in effect as described in Exhibit II and on the established pattern or practice with regard to sharing of benefit costs between the employer and plan members. In particular, this valuation under GASB 43 does not take into account the current $65 million maximum of annual payments that may be paid from the Fund, as there has been a history of increases in the annual dollar maximum. The valuation includes recognition of the excise tax. The applicable annual limitation used to determine the estimated amount of excise tax is assumed to increase 3.5% per year beginning in 2019. The effect on the obligation of other future aspects of the Patient Protection and Affordable Care Act (PPACA) and the Health Care and Education Reconciliation Act (HCERA) of 2010 are assumed to be *de minimis*.
Assumption Changes since Prior Valuation:	Valuation-year per capita health costs were updated. Assumed rates of enrollment were decreased. Mortality, disability, turnover, and retirement rates were modified. The payroll growth rate was lowered from 4.00% to 3.50%. The amortization method for GASB was changed from a 30-year open period, level percentage of pay to a 30-year closed period, level percentage of pay.

EXHIBIT II

Summary of Plan

This exhibit summarizes the major benefit provisions as included in the valuation. To the best of our knowledge, the summary represents the substantive plans as of the measurement date. It is not intended to be, nor should it be interpreted as, a complete statement of all benefit provisions.

Retiree Eligibility:

Recipient of a service retirement, disability, or survivor's pension from the Public School Teachers' Pension and Retirement Fund of Chicago. Pension eligibility is generally as follows:

Service Retirement Pension:

An employee first hired before January 1, 2011 is eligible to retire at age 55 with at least 20 years of service or at age 62 with 5 years of service. An employee first hired on or after January 1, 2011 is eligible to retire at age 62 with at least 10 years of service credit.

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. 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.

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.

Duty Disability Benefit:

Upon disability resulting from an injury incurred while working, an employee is entitled to a disability benefit.

Additional requirements apply to those who terminate prior to retirement.

Benefits:	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. 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. 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).

EXHIBIT III

Definitions of Terms

The following list defines certain technical terms used in GASB Statements:

Assumptions or Actuarial Assumptions: The estimates on which the cost of the Plan is calculated including:

(a) Investment return — the rate of investment yield which the Plan 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.

Actuarial Present Value of Total Projected Benefits (APB): Present value of all future benefit payments for current retirees and active employees taking into account assumptions about demographics, turnover, mortality, disability, retirement, health care trends, and other actuarial assumptions.

Normal Cost: The amount of contributions required to fund the benefit allocated to the current year of service.

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 of the interest which the sum is expected to earn before it is entirely paid out in benefits.

Actuarial Value of Assets (AVA):	The value of assets used by the actuary in the valution. These may be at market value or some other method used to smooth variations in market value from one valuation to the next.
Funded Ratio:	The ratio AVA/AAL.
Unfunded Actuarial Accrued Liability(UAAL):	The extent to which the actuarial accrued liability of the Plan exceeds the assets of the Plan. There is a wide range of approaches to paying off the unfunded actuarial accrued liability, from meeting the interest accrual only to amortizing it over a specific period of time.
Amortization of the Unfunded Actuarial Accrued Liability:	Payments made over a period of years equal in value to the Plan's unfunded actuarial accrued liability.
Investment Return (discount rate):	The rate of earnings of the Plan 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. If the plan is funded on a pay-as-you-go basis, the discount rate is tied to the expected rate of return on day-to-day employer funds.
Covered Payroll:	Annual reported salaries for all active participants on the valuation date.
ARC as a Percentage of Covered Payroll:	The ratio of the annual required contribution to covered payroll.
Health Care Cost Trend Rates:	The annual rate of increase in net claims costs per individual benefiting from the Plan.
Annual Required Contribution (ARC):	The ARC is equal to the sum of the normal cost and the amortization of the unfunded actuarial accrued liability.

EXHIBIT IV

Accounting Requirements

The Governmental Accounting Standards Board (GASB) issued Statement Number 43 -- Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans. Under this statement, all state and local government entities that provide other post employment benefits (OPEB) are required to report the cost of these benefits on their financial statements. The accounting standards supplement cash accounting, under which the expense for postemployment benefits is equal to benefit and administrative costs paid on behalf of retirees and their dependents (i.e., a pay-as-you-go basis).

The statement covers postemployment benefits of health, prescription drug, dental, vision and life insurance coverage for retirees; long-term care coverage, life insurance and death benefits that are not offered as part of a pension plan; and long-term disability insurance for employees. The benefits valued in this report are limited to those described in Section 4, which are based on those provided under the terms of the substantive plan in effect at the time of the valuation and on the pattern of sharing costs between the employer and plan members. The projection of benefits is not limited by legal or contractual limits on funding the plan unless those limits clearly translate into benefit limits on the substantive plan being valued.

The standard introduced an accrual-basis accounting requirement, thereby recognizing the employer cost of postemployment benefits over an employee's career. The standard also introduced a consistent accounting requirement for both pension and non-pension benefits.

The total cost of providing postemployment benefits is projected, taking into account assumptions about demographics, turnover, mortality, disability, retirement, health care trends, and other actuarial assumptions. These assumptions are summarized in Exhibit I of Section 4. This amount is then discounted to determine the actuarial present value of the projected cost of these benefits (APB). The actuarial accrued liability (AAL) is the portion of the present value of the total projected benefits allocated to years of employment prior to the measurement date. The unfunded actuarial accrued liability (UAAL) is the difference between the AAL and the actuarial value of assets in the Plan.

Once the UAAL is determined, the Annual Required Contribution (ARC) is determined as the normal cost (the APB allocated to the current year of service) and the amortization of the UAAL. This ARC is compared to actual contributions made. In addition, Required Supplementary Information (RSI) must be reported, including historical information about the UAAL and the progress in funding the Plan. Exhibit III of Section 4 contain a definition of terms.

The calculation of an accounting obligation does not, in and of itself, imply that there is any legal liability to provide the benefits valued, nor is there any implication that the Employer is required to implement a funding policy to satisfy the projected expense.

Actuarial calculations reflect a long-term perspective, and the methods and assumptions use techniques designed to reduce short term volatility in accrued liabilities and the actuarial value of assets, if any.

Actuarial valuations involve estimates of the value of reported amounts and assumptions about the probability of events far into the future, and the actuarially determined amounts are subject to continual revision as actual results are compared to past expectations and new estimates are made about the future.