Teachers Retirement Association Fund
ACTUARIAL VALUATION REPORT

July 1, 2003

A MILLIMAN GLOBAL FIRM
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December 9, 2003

Legislative Commission on
Pensions and Retirement
55 State Office Building
St. Paul, Minnesota 55155

RE: Teachers Retirement Association Fund

Commission Members:

Pursuant to the terms of our Actuarial Services Contract, we have performed an actuarial valuation of the Fund as of July 1, 2003.

The results of our calculations are set forth in the following report, as are the actuarial assumptions upon which our calculations have been made. Although we have reviewed the data for reasonableness and consistency, we have relied on the basic employee data and asset figures as submitted by the Teachers Retirement Association.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with the requirements of Section 356.215, Minnesota Statutes, and the requirements of the Standards for Actuarial Work, adopted by the Commission.

We, Thomas K. Custis and William V. Hogan, are actuaries for Milliman USA. We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,

Milliman USA

Thomas K. Custis

Thomas K. Custis, F.S.A., M.A.A.A.
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Consulting Actuary

TKC/WVH/bh

Teachers Retirement Association Fund

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Teachers Retirement Association Fund

Report Highlights

(dollars in thousands)

	07/01/02 Valuation	07/01/03 Valuation
A. CONTRIBUTIONS % OF PAYROLL (Table 11)		
1. Statutory Contributions - Chapter 354 % of Payroll	10.00%	10.00%
2. Required Contributions - Chapter 356 % of Payroll	7.57%	8.37%
3. Sufficiency (Deficiency)	2.43%	1.63%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$ 17,378,994	$ 17,384,179
b. Current Benefit Obligations (Table 8)	$ 15,715,244	$ 16,103,696
c. Funding Ratio	110.59%	107.95%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$ 17,378,994	$ 17,384,179
b. Actuarial Accrued Liability (Table 9)	$ 16,503,099	$ 16,856,379
c. Funding Ratio	105.31%	103.13%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$ 20,204,561	$ 20,214,690
b. Current and Expected Future Benefit Obligations	$ 18,831,713	$ 19,258,017
c. Funding Ratio	107.29%	104.97%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	71,690	71,916
b. Projected Annual Earnings	$ 3,040,422	$ 3,163,057
c. Average Annual Earnings (Projected $)	$ 42,411	$ 43,983
d. Average Age	42.8	43.0
e. Average Service	11.6	11.6
2. Others		
a. Service Retirements (Table 4)	32,231	33,290
c. Survivors (Table 5)	2,192	2,351
b. Disability Retirements (Table 6)	551	558
d. Deferred Retirements (Table 7)	8,680	9,304
e. Terminated Other Non-Vested (Table 7)	19,022	19,256
f. Total	62,676	64,759

Commentary

Purpose

The purpose of this valuation is to determine the financial status of the Plan. In order to achieve this purpose, an actuarial valuation is made at the beginning of each fiscal year as required by Section 356.215 of Minnesota Statutes.

Report Highlights

The financial status of the Plan can be measured by three different funding ratios:

- The Accrued Benefit Funding Ratio is a measure of current funding status and, when viewed over a period of years, presents a view of the funding progress. It is based upon benefits which have been earned by service to the valuation date. This year's ratio is 107.95%. The corresponding ratio for the prior year was 110.59%.
- The Accrued Liability Funding Ratio is also a measure of funding status and funding progress. It is based on the actuarial cost method that has historically been used by the State. For 2003 the ratio is 103.13%, which is a decrease from the 2002 ratio of 105.31%.
- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 104.97% verifies that the current statutory contributions are sufficient.

Asset Information (Tables 1 and 2)

Effective with the July 1, 2000 valuation of the fund, Minnesota Statutes require that the asset value used for actuarial purposes spread differences between actual return (measured on a market-value basis) and expected return on non-MPRIF assets over five years, in a manner similar to that already being used within the MPRIF. The previous method required under Minnesota Statutes recognized one third of the unrealized gains and losses. An Asset Valuation Method requirement exists because market values (which include all unrealized gains and losses) are typically volatile and can produce erratic changes in the contribution requirements from year to year. The intent of the change to the current method is to employ a more effective asset smoothing technique which is market-value based and which eliminates artificial bias related to manager style. The effective date of this requirement is July 1, 2000 with full transition to be accomplished as of July 1, 2003.

The calculation of the Actuarial Value of Assets is shown in Table 1 on lines E.1 to E.4. Actuarial Value of Assets is determined as:

> Market Value of Assets at June 30, 2003, *less*
>
> 80% of the current year Unrecognized Asset Return at July 1, 2003 (the difference between actual net return on Market Value of Assets between June 30, 2002 and June 30,

2003 and the asset return expected during that period based on the assumed interest rate employed in the July 1, 2002 Actuarial Valuation); *less*

60% of the current year Unrecognized Asset Return at July 1, 2002 (the difference between actual net return on Market Value of Assets between June 30, 2001 and June 30, 2002 and the asset return expected during that period based on the assumed interest rate employed in the July 1, 2001 Actuarial Valuation); *less*

40% of the current year Unrecognized Asset Return at July 1, 2001 (the difference between actual net return on Market Value of Assets between June 30, 2000 and June 30, 2001 and the asset return expected during that period based on the assumed interest rate employed in the July 1, 2000 Actuarial Valuation); *less*

20% of the current year Unrecognized Asset Return at July 1, 2000 (the difference between actual net return on Market Value of Assets between June 30, 1999 and June 30, 2000 and the asset return expected during that period based on the assumed interest rate employed in the July 1, 1999 Actuarial Valuation); *less*

Since its adoption on July 1, 2000, the Asset Valuation Method has functioned effectively to smooth the significant variability in market value returns. It is prudent to note, however, that the deferral of recognition of the large market losses of the last three fiscal years means there has accumulated a significant negative return amount that will be recognized over the next few years. This means that in order for asset returns on a "Current Assets" basis to be at or near the assumed 8.5%, market value returns will need to be substantially above 8.5%; conversely, if market value returns are at or near the assumed 8.5%, returns measured on a "Current Assets" basis will be substantially lower, resulting in actuarial losses.

The term "Actuarial Value of Assets" is used to indicate that the value was determined for use in this actuarial valuation. Since Minnesota Statutes refer to this value as "Current Assets," the latter phrase will be used in the remainder of this report.

This Plan participates in the Minnesota Post Retirement Investment Fund (i.e., MPRIF). After the MPRIF liability has been calculated for each participating Plan, the State Board of Investments, (i.e., SBI) will determine each Plan's portion of the excess earnings for the January benefit increase as well as the Plan's allocated market share of MPRIF.

Actuarial Balance Sheet (Table 8)

An actuarial balance sheet provides a method for evaluating current and future levels of funding.

The Current Benefit Obligation used to measure current funding levels is calculated as follows:

- <u>For Active Members</u> – Salary and service are projected to retirement to determine benefits for each member and the ratio of credited service to total service establishes the portion of the projected benefit to be used in calculating the current funding level.

- For Non-Active Members – The discounted value of benefits, including augmentation in cases where benefits have not commenced.

GASB Disclosure

Disclosure of the Current Benefit Obligation amounts used to be required by Statement No. 5 of the Governmental Accounting Standards Board (GASB). However, Statement No. 5 has been superceded by Statement No. 25. Tables 14 and 15 of this report are included to fulfill the requirements of Statement No. 25.

Actuarial Cost Method (Table 9)

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Actuarial Cost Method. The primary characteristic of this method is that it allocates costs as a level percentage of payroll.

A comparison of this actuarial method (Table 9) to the actuarial balance sheet (Table 8) illustrates the two techniques for allocating liabilities of active Members to past and future. As noted in the prior section, the balance sheet allocates benefits and corresponding liabilities, on the basis of service. The method used in Table 9 allocates liabilities so that the cost each year will be a constant percentage of payroll. Both approaches, however, calculate the value of all future benefits the same way (see line F of Table 8 and line A6, column 1, of Table 9).

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Actuarial Cost Method by comparing the liabilities allocated to past service (Actuarial Accrued Liability) to the Current Assets. This amount, line B3, is funded over the remaining years to the amortization date by a series of payments that remain a constant percentage of payroll each year.

Source of Actuarial Gains and Losses (Table 10)

The assumptions used in making the calculations using the Entry Age Normal Actuarial Cost Method are based on long-term expectations. Each year the actual experience will deviate from the long-term expectations. For a detailed analysis of the major components, refer to Table 10.

Contribution Sufficiency (Table 11)

This report determines the adequacy of Statutory Contributions by comparing the Statutory Contributions to the Required Contributions.

The Required Contributions, set forth in Chapter 356, consist of:

- Normal costs based on the Entry Age Normal Actuarial Cost Method.
- A Supplemental Contribution for amortizing any Unfunded Actuarial Accrued Liability.
- An Allowance for Expenses.

Table 11 shows the Plan has a contribution sufficiency since the Statutory Contribution Rate is 10.00% compared to the Required Contribution Rate of 8.37%.

Changes in Actuarial Assumptions

All actuarial assumptions are the same as those used in the prior valuation. Table 12 contains a summary of all actuarial assumptions and methods.

Changes in Plan Provisions

All plan provisions are the same as those used in the prior actuarial valuation of the Fund. Tables 13A and 13B contain summaries of current plan benefits.

Teachers Retirement Association Fund

Statement of Plan Net Assets

(dollars in thousands)

July 1, 2003

	Market Value	Cost Value
A. ASSETS IN TRUST		
1. Cash, Equivalents, Short-Term Securities	$ 40,143	$ 40,143
2. Fixed Income	1,449,852	1,458,648
3. Equity	4,455,512	5,066,459
4. Real Estate	228,034	189,302
5. Equity in MPRIF*	9,713,507	9,713,507
6. Invested Securities Lending Collateral	1,094,261	1,094,261
7. Other	12,463	12,463
Subtotal	$ 16,993,772	$ 17,574,783
B. ASSETS RECEIVABLE	26,221	26,221
C. LIABILITIES		
1. Invested Securities Lending Collateral	(1,094,261)	(1,094,261)
2. Other	(17,840)	(17,840)
Subtotal	(1,112,101)	(1,112,101)
D. NET ASSETS HELD IN TRUST FOR PENSION BENEFITS		
1. MPRIF Reserves	9,713,507	9,713,507
2. Member Reserves	1,561,048	1,561,048
3. Other Non-MPRIF Reserves	4,633,337	5,214,348
4. Total Assets Available for Benefits	$ 15,907,892	$ 16,488,903

E. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Market Value of Assets Available for Benefits (D4)		$ 15,907,892
2. Unrecognized Asset Returns (UAR)		
a. June 30, 2003	(401,116)	
b. June 30, 2002	(1,150,511)	
c. June 30, 2001	(1,241,462)	
d. June 30, 2000	157,486	
3. UAR Adjustment: .80 * 2(a) + .60 * 2(b) + .40 * 2(c) +.20 * 2(d)		(1,476,287)
4. Actuarial Value of Assets (E1 - E3) (Same as "Current Assets")		$ 17,384,179

* *The number shown is the full MPRIF reserve amount. The actual MPRIF market value of $7,407,222 is not used for funding purposes because this deficiency is accounted for separately and is expected to be recovered from future excess earnings on MPRI funds.*

Teachers Retirement Association Fund

Statement of Change In Plan Net Assets

(dollars in thousands)

Year Ending June 30, 2003

	Non-MPRIF Assets	MPRIF Reserve	Market Value
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$ 6,297,680	$ 9,555,364	$ 15,853,044
B. ADDITIONS			
1. Member Contributions	$ 155,577	0	$ 155,577
2. Employer Contributions	149,481	0	149,481
3. Contributions From Other Sources	1,490	0	1,490
4. MPRIF Income	0	623,117	623,117
5. Net Investment Income			
a. Interest and Dividends	118,955	0	118,955
b. Net Appreciation/(Depreciation)	20,973	0	20,973
c. Investment Expenses	(18,958)	0	(18,958)
d. Net Subtotal	120,970	0	120,970
6. Other	2,927	0	2,927
7. Total Additions	$ 430,445	$ 623,117	$ 1,053,562
C. OPERATING EXPENSES			
1. Service Retirements	$ 0	$ 953,507	$ 953,507
2. Disability Benefits	11,346	0	11,346
3. Survivor Benefits	1,180	12,433	13,613
4. Refunds	6,656	0	6,656
5. Administrative Expenses	13,158	0	13,158
6. Other	434	0	434
7. Total Disbursements	$ 32,774	$ 965,940	$ 998,714
D. OTHER CHANGES IN RESERVES			
1. Annuities Awarded	(515,896)	515,896	0
2. Mortality Gain (Loss)	14,930	(14,930)	0
3. Change in MPRIF Assumptions	0	0	0
4. Total Other Changes	(500,966)	500,966	0
E. ASSETS AVAILABLE AT END OF PERIOD	$ 6,194,385	$ 9,713,507	$ 15,907,892
F. DETERMINATION OF CURRENT YEAR UNRECOGNIZED ASSET RETURN			
1. Average Balance			
(a) Non-MPRIF Assets Available at Beginning of Period			6,297,680
(b) Non-MPRIF Assets Available at End of Period*			6,179,455
(c) Average Balance {[F1.a + F1.b - B5.d-B6] / 2}			6,176,619
2. Expected Return: .085 * F1.c			525,013
3. Actual Return			123,897
4. Current Year UAR: F.3 - F.2			$ (401,116)

* Before adjustment for MPRIF mortality gain (loss) and new MPRIF assumptions

Teachers Retirement Association Fund

Active Members as of July 1, 2003

	Years of Service								
Age	≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	1,225	839	0	0	0	0	0	0	2,064
25-29	1,503	6,299	1,153	0	0	0	0	0	8,955
30-34	640	3,143	4,714	671	0	0	0	0	9,168
35-39	630	1,772	2,432	2,989	401	0	0	0	8,224
40-44	839	1,722	1,568	1,866	2,302	321	0	0	8,618
45-49	728	1,470	1,567	1,426	1,578	2,194	737	0	9,700
50-54	581	1,301	1,362	1,529	1,506	1,627	3,459	1,468	12,833
55-59	542	700	735	855	1,001	945	1,506	2,968	9,252
60-64	275	350	280	237	298	327	332	394	2,493
65+	192	161	66	46	35	29	27	53	609
ALL	7,155	17,757	13,877	9,619	7,121	5,443	6,061	4,883	71,916

Average Annual Earnings

	Years of Service								
Age	≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	21,564	28,027	0	0	0	0	0	0	24,191
25-29	19,191	28,689	37,650	0	0	0	0	0	28,249
30-34	24,260	29,046	38,108	46,725	0	0	0	0	34,665
35-39	18,344	28,554	38,631	46,879	53,518	0	0	0	38,629
40-44	20,394	27,422	38,921	47,505	53,427	54,380	0	0	41,129
45-49	13,546	26,468	38,768	47,865	52,038	54,954	58,548	0	43,671
50-54	12,199	25,637	37,979	46,640	53,603	56,768	57,514	59,166	48,497
55-59	8,874	22,754	37,032	45,555	54,256	56,550	60,487	60,806	50,391
60-64	8,231	17,431	28,221	43,034	53,708	58,278	63,742	67,701	43,868
65+	7,182	9,019	19,103	37,509	55,534	60,417	60,877	73,446	24,712
ALL	17,450	27,543	37,969	46,841	53,300	55,968	58,735	61,007	40,734

	Prior Fiscal Year Earnings (in millions) by Years of Service								
Age	≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
All	125	489	527	451	380	305	356	298	2,929

Teachers Retirement Association Fund

Service Retirements as of July 1, 2003

	Years Retired							
Age	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	0	0	0	0	0	0	0	0
50-54	22	4	0	0	0	0	0	26
55-59	1,833	1,814	27	0	0	0	0	3,674
60-64	1,208	4,242	2,167	28	0	0	0	7,645
65-69	362	1,548	3,812	1,535	20	1	2	7,280
70-74	42	179	1,818	2,644	954	5	1	5,643
75-79	5	22	228	1,382	1,807	404	1	3,849
80-84	2	2	19	188	1,244	878	146	2,479
85+	0	0	1	12	143	983	1,555	2,694
ALL	3,474	7,811	8,072	5,789	4,168	2,271	1,705	33,290

Average Annual Benefit

	Years Retired							
Age	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	0	0	0	0	0	0	0	0
50-54	20,875	20,857	0	0	0	0	0	20,873
55-59	29,292	32,207	29,654	0	0	0	0	30,734
60-64	25,073	33,078	31,354	27,463	0	0	0	31,304
65-69	17,243	22,600	29,427	27,639	23,670	8,821	2,874	26,966
70-74	11,809	21,586	26,931	29,327	27,873	21,087	9,267	27,923
75-79	6,136	20,874	27,495	28,329	33,075	21,617	26,667	29,731
80-84	1,917	33,774	16,679	27,673	29,636	27,566	15,223	27,787
85+	0	0	1,033	11,874	24,298	27,004	20,471	23,012
ALL	26,256	30,496	29,295	28,542	30,512	26,242	19,998	28,596

	Total Annual Benefit (in thousands) by Years Retired							
Age	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
All	91,213	238,204	236,469	165,230	127,174	59,596	34,097	951,961

Teachers Retirement Association Fund

Survivors as of July 1, 2003

Age	Years Since Death <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	23	37	22	1	4	1	0	88
50-54	19	32	20	7	0	0	0	78
55-59	35	58	46	6	1	0	0	146
60-64	54	77	95	28	3	2	3	262
65-69	58	107	120	66	15	5	2	373
70-74	77	115	128	77	43	22	9	471
75-79	63	102	118	85	56	10	10	444
80-84	27	48	79	51	30	20	21	276
85+	30	32	42	36	17	24	32	213
ALL	386	608	670	357	169	84	77	2,351

Average Annual Benefit

Age	Years Since Death <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	12,198	20,260	13,343	5,960	11,980	4,647	0	15,708
50-54	19,469	13,925	19,811	11,431	0	0	0	16,561
55-59	17,357	23,627	21,585	8,888	3,061	0	0	20,734
60-64	21,953	22,868	24,165	16,890	19,480	14,659	14,714	22,316
65-69	23,590	23,351	26,531	20,136	25,098	20,449	21,131	23,862
70-74	27,367	26,389	27,450	23,641	19,878	26,212	18,610	25,637
75-79	25,414	22,333	25,760	26,343	25,795	33,737	22,909	25,155
80-84	30,635	22,872	26,825	26,995	24,833	31,885	19,766	26,155
85+	25,790	26,266	22,606	22,897	29,129	23,549	18,726	23,698
ALL	23,629	23,151	25,051	22,974	23,819	26,823	19,446	23,802

Total Annual Benefit (in thousands) by Years Since Death

Age	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
All	9,121	14,076	16,784	8,202	4,025	2,253	1,497	55,959

Teachers Retirement Association Fund

Disability Retirements as of July 1, 2003

Age	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
	Years Disabled							
<50	15	20	14	5	1	0	0	55
50-54	32	28	37	8	0	0	0	105
55-59	25	61	67	16	6	3	0	178
60-64	24	48	84	31	9	5	1	202
65-69	0	9	6	2	0	1	0	18
70-74	0	0	0	0	0	0	0	0
75-79	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	0	0	0
85+	0	0	0	0	0	0	0	0
ALL	96	166	208	62	16	9	1	558

Average Annual Benefit

Age	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
	Years Disabled							
<50	8,010	10,162	9,106	7,399	4,255	0	0	8,948
50-54	15,982	13,605	15,083	12,669	0	0	0	14,779
55-59	18,222	20,808	22,101	17,920	15,205	36,197	0	20,742
60-64	17,463	22,576	28,945	20,658	17,224	14,777	4,895	23,803
65-69	0	12,470	27,064	29,075	0	15,662	0	19,357
70-74	0	0	0	0	0	0	0	0
75-79	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	0	0	0
85+	0	0	0	0	0	0	0	0
ALL	15,690	18,369	22,885	18,123	15,657	22,015	4,895	19,521

Total Annual Benefit (in thousands) by Years Disabled

Age	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
All	1,506	3,049	4,760	1,124	251	198	5	10,893

Teachers Retirement Association Fund

Reconciliation of Members

			Terminated	
		Actives	Deferred Retirement	Other Non-Vested
A.	ON JUNE 30, 2002	71,690	8,680	19,022
B.	ADDITIONS	5,249	5,079	566
C.	DELETIONS			
	1. Service Retirement	(1,408)	(410)	0
	2. Disability	0	0	0
	3. Death	(42)	(33)	0
	4. Terminated - Deferred	(5,079)	0	0
	5. Terminated - Refund	(311)	0	(922)
	6. Terminated - Other Non-Vested	0	0	0
	7. Returned as active	1,876	(1,876)	0
	8. Transferred to Other Fund	(5)	0	0
	9. Transferred from Other Fund	0	0	0
D.	DATA ADJUSTMENTS	(54)	(2,136)	590
	1. Vested	55,164		
	2. Non-Vested	16,752		
E.	TOTAL ON JUNE 30, 2003	71,916	9,304	19,256

		Recipients		
		Retirement Annuitants	Disabled	Survivors
A.	ON JUNE 30, 2002	32,231	551	2,192
B.	ADDITIONS	1,754	74	241
C.	DELETIONS			
	1. Service Retirement	0	(23)	0
	2. Death	(667)	(35)	(50)
	3. Annuity Expired	0	0	(51)
	4. Returned as Active	0	(9)	0
D.	DATA ADJUSTMENTS	(28)	0	19
E.	TOTAL ON JUNE 30, 2003	33,290	558	2,351

Teachers Retirement Association Fund

Actuarial Balance Sheet

(dollars in thousands)

July 1, 2003

		Non-Vested	Vested	Total
A.	CURRENT ASSETS (Table 1, Line E4)			$ 17,384,179
B.	EXPECTED FUTURE ASSETS			
	1. Present Value of Expected Future Statutory Supplemental Contributions (See Table 11)			$ 428,873
	2. Present Value of Future Normal Costs			2,401,638
	3. Total Expected Future Assets			$ 2,830,511
C.	TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$ 20,214,690
D.	CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
	1. Benefit Recipients			
	a. Retirement Annuities		$ 9,280,849	$ 9,280,849
	b. Disability Benefits		136,621	136,621
	c. Surviving Spouse and Child Benefits		448,019	448,019
	2. Deferred Retirements with Future Augmentation		361,096	361,096
	3. Former Members Without Vested Rights		60,946	60,946
	4. Active Members			
	a. Retirement Annuities	$ 21,516	5,314,982	5,336,498
	b. Disability Benefits	89,731	0	89,731
	c. Surviving Spouse and Child Benefits	34,757	0	34,757
	d. Deferred Retirements	5,252	318,276	323,528
	e. Refund Liability Due to Death or Withdrawal	0	31,651	31,651
	5. Total Current Benefit Obligations	$ 151,256	$ 15,952,440	$ 16,103,696
E.	EXPECTED FUTURE BENEFIT OBLIGATIONS			$ 3,154,321
F.	TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$ 19,258,017
G.	CURRENT UNFUNDED ACTUARIAL LIABILITY (D5 - A)			$ (1,280,483)
H.	CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F - C)			$ (956,673)

Teachers Retirement Association Fund

Determination of Unfunded Actuarial Accrued Liability (UAAL) and Supplemental Contribution Rate

(dollars in thousands)

July 1, 2003

	Actuarial Present Value of Projected Benefits	Actuarial Present Value of Future Normal Costs	Actuarial Accrued Liability
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	$ 8,133,462	$ 1,870,677	$ 6,262,785
b. Disability Benefits	154,007	60,945	93,062
c. Survivor's Benefits	60,053	25,431	34,622
d. Deferred Retirements	559,990	336,788	223,202
e. Refunds Due to Death or Withdrawal	62,974	107,797	(44,823)
f. Total	$ 8,970,486	$ 2,401,638	$ 6,568,848
2. Deferred Retirements With Future Augmentation	361,096		361,096
3. Former Members Without Vested Rights	60,946		60,946
4. Annuitants in MPRIF	9,713,507		9,713,507
5. Recipients Not in MPRIF	151,982		151,982
6. Total	$ 19,258,017	$ 2,401,638	$ 16,856,379
B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)			
1. AAL (A6)			$ 16,856,379
2. Current Assets (Table 1; Line E4)			17,384,179
3. UAAL (B1 - B2)			$ (527,800)
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE			
1. Present Value of Future Payrolls Through the Amortization Date of July 1, 2033			58,749,696
2. Supplemental Contribution Rate (B3/C1)			-0.90%

Teachers Retirement Association Fund

Changes in Unfunded Actuarial Accrued Liability (UAAL)

(dollars in thousands)

Year Ending June 30, 2003

A. UAAL AT BEGINNING OF YEAR	$	(875,895)
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING		
1. Normal Cost and Expenses	$	277,587
2. Contributions		(305,058)
3. Interest on A, B1, and B2		(75,619)
4. Total (B1+B2+B3)	$	(103,090)
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$	(978,985)
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED		
1. Salary Increases	$	(59,162)
2. Investment Return		580,484
3. MPRIF Mortality		(14,930)
4. Mortality of Other Benefit Recipients		(8,268)
5. Other Items		(46,939)
6. Total	$	451,185
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$	(527,800)
F. CHANGE IN UNFUNDED ACTUARIAL ACCRUED LIABILITY DUE TO CHANGE IN ACTUARIAL METHODS		0
G. CHANGE IN UNFUNDED ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS		0
H. UAAL AT END OF YEAR (E+F+G)	$	(527,800)

Teachers Retirement Association Fund

Determination of Contribution Sufficiency

(dollars in thousands)

July 1, 2003

	Percent of Payroll	Dollar Amount
A. STATUTORY CONTRIBUTIONS - CHAPTER 354		
1. Employee Contributions	5.00%	$ 158,163
2. Employer Contributions	5.00%	158,163
3. Total	10.00%	$ 316,326
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	7.01%	$ 221,706
b. Disability Benefits	0.21%	6,615
c. Survivors	0.09%	2,779
d. Deferred Retirement Benefits	1.17%	37,070
e. Refunds Due to Death or Withdrawal	0.36%	11,413
f. Total	8.84%	$ 279,583
2. Supplemental Contribution Amortization by July 1, 2033 of UAAL	-0.90%	(28,468)
3. Allowance for Expenses	0.43%	13,601
4. Total	8.37%	$ 264,716
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) [A3-B4]	1.63%	51,610

Note: Projected Annual Payroll for Fiscal Year Beginning on the Valuation Date: $ 3,163,057

Teachers Retirement Association Fund

Summary of Actuarial Assumptions and Methods

Interest:	**Pre-Retirement**: 8.5% per annum **Post-Retirement**: 8.5% per annum
Benefit Increases After Retirement:	Payment of earnings on retired reserves in excess of 6% accounted for by 6% post-retirement assumptions.
Interest on Member Contributions:	Members and former Members who are eligible for the money purchase annuity are assumed to receive interest credits equal to the Pre-Retirement Interest rate. All other Members and former Members receive the interest crediting rate as specified in statutes.
Salary Increases:	Reported salary for prior fiscal year, with new hires annualized, increased according to the ultimate table below to current fiscal year and annually for each future year. During a 10-year select period, 0.3 x (10 – T) where T is completed years of service is added to the ultimate rate.
Mortality:	**Pre-Retirement**: Male - 1983 Group Annuity Mortality Table for males set back 12 years. Female - 1983 Group Annuity Mortality Table for females set back 10 years. **Post-Retirement**: Male - Same as above except set back 6 years. Female - Same as above except set back 3 years. **Post-Disability**: Male - 1965 RRB rates through age 54. For ages 55 to 64, graded rates between 1965 RRB rates and the Post-Retirement mortality table. For ages 65 and later, the Post-Retirement mortality table. Female - 1965 RRB rates through age 54. For ages 55 to 64, graded rates between 1965 RRB rates and the Post-Retirement mortality table. For ages 65 and later, the Post-Retirement mortality table.

***Retirement Age*:**	Graded rates beginning at age 55 as shown in rate table. Members who have attained the highest assumed retirement age will retire in one year.
***Separation*:**	Select and ultimate rates were based on plan experience as of June 30, 2000. Ultimate rates after the third year are shown in rate table. Select rates are as follows:

Gender	First Year	Second Year	Third Year
Male	.45	.12	.06
Female	.40	.10	.08

***Disability*:**	Rates as shown in table.
Allowance for Combined Service Annuity:	Liabilities for active Members are increased by 1.4% and liabilities for former Members are increased by 4% to account for the effect of some Participants having eligibility for a Combined Service Annuity.
***Expenses*:**	Prior year expenses expressed as percentage of prior year payroll.
***Return of Contributions*:**	All employees withdrawing after becoming eligible for a deferred benefit were assumed to take the larger of their contributions accumulated with interest or the value of their deferred benefit.
***Family Composition*:**	85% of male Members and 65% of female Members are assumed to be married. Female is three years younger than male. Assume Members have no children.
***Social Security*:**	N/A
***Special Consideration*:**	Married Members assumed to elect subsidized joint and survivor form of annuity as follows:

Males -	15% elect 50% J&S option 25% elect 75% J&S option 55% elect 100% J&S option
Females -	20% elect 50% J&S option 10% elect 75% J&S option 30% elect 100% J&S option

***Actuarial Cost Method*:** Entry Age Normal Actuarial Cost Method with normal costs expressed as a level percentage of earnings. Under this method, Actuarial Gains (Losses) reduce (increase) the Unfunded Actuarial Accrued Liability.

***Asset Valuation Method*:** Market Value, adjusted for amortization obligations receivable at the end of each fiscal year, less a percentage of the Unrecognized Asset Return determined at the close of each of the four preceding fiscal years. Unrecognized Asset Return is the difference between actual net return on Market Value of Assets and the asset return expected during the fiscal year (based on the assumed interest rate employed in the July 1 Actuarial Valuation of the fiscal year). Transition rules apply between July 1, 2001 and July 1, 2003, when the method is fully in effect.

***Payment on the Unfunded Actuarial Accrued Liability*:** A level percentage of payroll each year to the statutory amortization date assuming payroll increases of 5% per annum. If there is a negative Unfunded Actuarial Liability, the surplus amount shall be amortized over 30 years as a level percentage of payroll.

Separation Expressed as Number of Occurrences Per 10,000:

	Pre-Retirement Death		Withdrawal		Disability		Retirement		Salary Increases
Age	Male	Female	Male	Female	Male	Female	Rule of 90 Eligible	Other	
20	3	1	370	450	0	0	0	0	6.00%
21	3	1	360	450	0	0	0	0	6.00
22	3	1	350	450	0	0	0	0	6.00
23	3	1	340	450	0	0	0	0	6.00
24	3	1	330	450	0	0	0	0	6.00
25	3	1	320	450	0	0	0	0	6.00
26	3	1	310	450	0	0	0	0	6.00
27	3	2	300	450	0	0	0	0	6.00
28	3	2	290	450	0	0	0	0	6.00
29	3	2	280	450	0	0	0	0	6.00
30	4	2	270	450	0	0	0	0	6.00
31	4	2	260	450	1	1	0	0	6.00
32	4	2	250	450	1	1	0	0	6.00
33	4	2	250	430	1	1	0	0	6.00
34	4	2	250	410	1	1	0	0	6.00
35	4	3	250	390	1	1	0	0	6.00
36	4	3	250	370	2	2	0	0	6.00
37	5	3	250	350	2	2	0	0	6.00
38	5	3	245	325	2	2	0	0	5.90
39	5	3	240	300	2	2	0	0	5.80
40	5	3	235	275	3	3	0	0	5.70
41	6	4	230	250	3	3	0	0	5.60
42	6	4	225	225	3	3	0	0	5.50
43	6	4	220	220	4	4	0	0	5.40
44	7	4	215	215	4	4	0	0	5.30
45	7	5	210	210	5	5	0	0	5.20
46	8	5	205	205	6	6	0	0	5.10
47	9	5	200	200	7	7	0	0	5.00
48	9	6	195	195	8	8	0	0	5.00
49	10	6	190	190	9	9	0	0	5.00

Separation Expressed as Number of Occurrences Per 10,000:

	Pre-Retirement Death		Withdrawal		Disability		Retirement		Salary Increases
Age	Male	Female	Male	Female	Male	Female	Rule of 90 Eligible	Other	Male
50	10	7	185	185	11	10	0	0	5.00%
51	11	7	180	180	13	11	0	0	5.00
52	12	8	175	175	15	12	0	0	5.00
53	14	8	170	170	17	13	0	0	5.00
54	15	9	165	165	19	14	0	0	5.00
55	17	10	0	0	22	16	5,000	900	5.00
56	19	11	0	0	24	18	5,000	900	5.00
57	22	12	0	0	26	20	5,000	900	5.00
58	25	14	0	0	28	22	5,000	900	5.10
59	28	15	0	0	30	24	5,000	1,200	5.20
60	31	16	0	0	33	25	5,000	1,200	5.30
61	35	18	0	0	37	26	5,000	2,000	5.40
62	39	19	0	0	41	27	5,000	2,000	5.50
63	43	21	0	0	46	28	5,000	2,000	5.60
64	48	23	0	0	52	29	5,000	2,000	5.70
65	52	25	0	0	0	0	5,000	5,000	5.70
66	57	28	0	0	0	0	3,500	3,500	5.70
67	61	31	0	0	0	0	3,500	3,500	5.70
68	66	34	0	0	0	0	3,500	3,500	5.70
69	71	38	0	0	0	0	3,500	3,500	5.70
70	77	42	0	0	0	0	3,500	3,500	5.70
71	84	47	0	0	0	0	10,000	10,000	5.70

Teachers Retirement Association Fund

Summary of Plan Provisions

This summary of provisions reflects the interpretation of applicable Statutes by the Commission Actuary for purposes of preparing this valuation. This interpretation is not intended to create or rescind any benefit rights in conflict with any Minnesota Statutes.

GENERAL

***Eligibility*:** A public school or MNSCU teacher who is not covered by the Social Security Act, except for teachers employed by Minneapolis, St. Paul, or Duluth public schools or by the University of Minnesota. Effective July 1, 2002, charter school teachers employed by Minneapolis, St. Paul, or Duluth public schools are covered by this fund.

No MNSCU teacher is a Member if that person elected coverage under Chapter 354B.

***Contributions*:**

Member: 9.0% of salary.

Employer: 9.0% of salary.

Allowable Service: A day of credit is earned if five hours are taught that day. A year is earned if 170 days of service are credited. Credit may also be provided for certain leaves if contributions are paid into the fund.

Salary: Compensation used for contribution purposes excluding lump-sum annual or sick leave payments, severance payments, any payments made in lieu of employer paid fringe benefits or expenses, and employer contributions to a Section 457 deferred compensation plan.

Average Salary: Average of the five highest successive years of salary. Average Salary is based on all Allowable Service if less than five years.

RETIREMENT

***Normal Retirement*:**

Eligibility:	Age 65 and three years of Allowable Service. Age 62 and 30 years of Allowable Service. Proportionate Retirement Annuity is available at age 65 and one year of Allowable Service.

***Early Retirement Eligibility*:**

Eligibility:	Age 55 and three years of Allowable Service. Any age with 30 years of Allowable Service. Rule of 90: Age plus Allowable Service totals 90.
Retirement Amount:	The greater of 2.2% of Average Salary for each of the first 10 years of Allowable Service and 2.7% of Average Salary for each subsequent year with reduction of 0.25% for each month the Member is under age 65 at time of retirement or under age 62 if 30 years of Allowable Service. No reduction if age plus years of Allowable Service totals 90; **OR** 2.7% of Average Salary for each year of Allowable Service assuming augmentation to age 65 at 3% per year and actuarial reduction for each month the Member is under age 65; **OR** for eligible Members, money purchase annuity equal to the actuarial equivalent of 220% of the Member's accumulated deductions plus interest thereon.
Form of Payment:	Life annuity. Actuarially equivalent options are: 50%, 75% or 100% joint and survivor with bounce back feature without additional reduction. 15 year certain and life. Guaranteed refund.
Benefit Increases:	Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF). A Member who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Members receiving benefits for at least

one full month but less than 12 full months will receive a partial pro rata increase.

Members retired under laws in effect before July 1, 1973 receive an additional lump-sum payment from TRA each year. In 1989, this lump-sum payment was the greater of $25 times each full year of Allowable Service or the difference between $400 times each full year of Allowable Service and the sum of the benefits paid from any Minnesota public pension plan plus cash payments from the Social Security Administration for the preceding fiscal year July 1, 1988 through June 30, 1989. In each following year, the lump-sum payment increases by the same percentage increase that is applied to regular annuities paid from MPRIF. Effective January 1, 2002, annual lump sum payment is divided by 12 and paid as a monthly life annuity in the annuity form elected.

Members who terminate service after June 30, 1997 and whose benefits commence during the period July 2, 1997 through July 1, 2002 shall receive a percentage of the July 1, 1997 permanent increase as follows:

July 2, 1997 - July 1, 1999	50%
July 2, 1999 - July 1, 1999	40%
July 2, 1999 - July 1, 2001	30%
July 2, 2001 - July 1, 2001	20%
July 2, 2001 - July 1, 2002	10%

DISABILITY

***Disability Benefit*:**

Eligibility: Total and permanent disability before normal retirement age with three years of Allowable Service.

Amount: Normal Retirement Benefit based on Allowable Service and Average Salary at disability without reduction for commencement before normal retirement age unless an optional annuity plan is selected. Supplemental benefit of $25 per month.

A Member who became disabled before July 1, 1997 whose benefit does not commence until after June 30, 1997 shall receive an actuarially equivalent increase to reflect the change from 5% to 6% in the post-retirement interest assumption.

Payments stop at normal retirement age or the five year anniversary of the effective date of the disability benefit, whichever is later. Payments stop earlier if disability ceases or death occurs. Benefits may be reduced on resumption of partial employment. If death occurs before retirement status, the surviving spouse and dependent children are eligible for survivor benefits.

Form of Payment: Same as for retirement.

Benefit Increases: Adjusted by TRA to provide same increase as MPRIF.

Members who become disabled after June 30, 1997 and whose benefits commence during the period July 1, 1997 through July 1, 2002 shall receive a percentage of the July 1, 1997 permanent increase as follows:

July 2, 1997 - July 1, 1999	50%
July 2, 1999 - July 1, 1999	40%
July 2, 1999 - July 1, 2001	30%
July 2, 2001 - July 1, 2001	20%
July 2, 2001 - July 1, 2002	10%

Retirement After Disability:

Eligibility: Normal retirement age or the five year anniversary of the effective date of the disability benefit, whichever is later.

Amount: Any optional annuity continues. Otherwise, the larger of the disability benefit paid before normal retirement age or the normal retirement benefit available at normal retirement age, or an actuarially equivalent optional annuity.

Benefit Increases: Same as for retirement.

DEATH

***Surviving Spouse Benefit*:**

Eligibility:	Active Member with 18 months of Allowable Service or Member receiving a disability benefit.
Amount:	50% of salary for the last full fiscal year preceding death. Maximum family benefit is $1,000 per month. Benefits paid until spouse's death. Surviving spouse optional annuity or refund of contributions may be elected in lieu of this benefit.

***Surviving Dependent Child Benefit*:**

Eligibility:	Active Member with 18 months of Allowable Service or Member receiving a disability benefit.
Amount:	10% of salary for the last full fiscal year preceding death. Family benefit minimum (including spouse's benefit) of 50% of salary and maximum $1,000 per month. Benefits paid until child marries, dies, or attains age 18 (age 22 if full-time student.)

***Surviving Spouse Optional Annuity*:**

Eligibility:	Member or former Member with three years of Allowable Service who dies before retirement or disability benefits commence.
Amount:	Survivor's payment of the 100% joint and survivor benefit or an actuarial equivalent term certain annuity. If commencement is prior to age 65 (age 62 if 30 years of service), the benefit is reduced same as early retirement with half the applicable reduction factor used from age 55 to the actual commencement age. If no surviving spouse, then an actuarial equivalent dependent child benefit is paid to age 20 or for five years if longer.

A survivor of a Member who terminated service before July 1, 1997 whose benefit does not commence until after June 30, 1997 shall receive an actuarially equivalent increase to reflect the change from 5% to 6% in the post-retirement interest assumption.

Benefit Increases: Adjusted by TRA to provide same increase as MPRIF except surviving spouse optional annuity benefit increases which are paid from MPRIF.

Survivors of Members who terminate service and die after June 30, 1997 and whose benefits commence during the period July 2, 1997 through July 1, 2002 shall receive a percentage of the July 1, 1997 permanent increase as follows:

July 2, 1997 - July 1, 1999	50%
July 2, 1999 - July 1, 1999	40%
July 2, 1999 - July 1, 2001	30%
July 2, 2001 - July 1, 2001	20%
July 2, 2001 - July 1, 2002	10%

Refund of Contributions:

Eligibility: Member dies before receiving any retirement benefits and survivor benefits are not elected.

Amount: The excess of the Member's contributions over any disability benefits paid plus 5% interest compounded annually if death occurred before May 16, 1989 and 6% interest compounded annually if death occurred on or after May 16, 1989.

TERMINATION

Refund of Contributions:

Eligibility: Thirty days following termination of teaching service.

Amount: Member's contributions with 5% interest compounded annually if termination occurred before May 16, 1989 and 6% interest compounded annually if termination occurred on or after May 16, 1989. A deferred annuity may be elected in lieu of a refund.

***Deferred Benefit*:**

Eligibility: Vested at date of termination. Current requirement is three years of Allowable Service.

Amount: Benefit computed under law in effect at termination and increased by the following percentage compounded annually: 0% before 7/1/71; 5% from 7/1/71 to 1/1/81; and 3% thereafter until January 1 of the year following attainment of age 55 and 5% thereafter until the annuity begins. Amount is payable as a normal or early retirement.

A Member who terminated service before July 1, 1997 whose benefit does not commence until after June 30, 1997 shall receive an actuarially equivalent increase to reflect the change from 5% to 6% in the post-retirement interest assumption;

OR

for eligible former Members, money purchase annuity equal to the actuarial equivalent of 220% of the former Member's accumulated deductions plus interest thereon.

Members who terminate service after June 30, 1997 and whose benefits commence during the period July 2, 1997 through July 1, 2002 shall receive a percentage of the July 1, 1997 permanent increase as follows:

July 2, 1997 - July 1, 1999	50%
July 2, 1999 - July 1, 1999	40%
July 2, 1999 - July 1, 2001	30%
July 2, 2001 - July 1, 2001	20%
July 2, 2001 - July 1, 2002	10%

SUMMARY OF SIGNIFICANT CHANGES

No significant changes have been reflected in this valuation of the Fund.

Teachers Retirement Association Fund Coordinated

Summary of Plan Provisions

This summary of provisions reflects the interpretation of applicable Statutes by the Commission Actuary for purposes of preparing this valuation. This interpretation is not intended to create or rescind any benefit rights in conflict with any Minnesota Statutes.

GENERAL

***Eligibility*:** A public school or MNSCU teacher who is covered by the Social Security Act, except for teachers employed by Minneapolis, St. Paul, or Duluth public schools or by the University of Minnesota. Effective July 1, 2002, charter school teachers employed by Minneapolis, St. Paul, or Duluth public schools are covered by this fund.

No MNSCU teacher will become a new Member unless that person elects coverage under Chapter 354.

***Contributions*:**

Member: 5.0% of salary.

Employer: 5.0% of salary.

Allowable Service: A day of credit is earned if five hours are taught that day. A year is earned if 170 days of service are credited. Credit may also be provided for certain leaves if contributions are paid into the fund.

Salary: Compensation used for contribution purposes excluding lump-sum annual or sick leave payments, severance payments, any payments made in lieu of employer paid fringe benefits or expenses, and employer contributions to a Section 457 deferred compensation plan.

Average Salary: Average of the five highest successive years of salary. Average Salary is based on all Allowable Service if less than five years.

RETIREMENT

***Normal Retirement*:**

Eligibility:

First hired before July 1, 1989:
Age 65 and three years of Allowable Service. Age 62 and 30 years of Allowable Service. Proportionate Retirement Annuity is available at age 65 and one year of Allowable Service.

First hired after June 30, 1989:
The greater of age 65 or the age eligible for full Social Security retirement benefits (but not to exceed age 66) and three years of Allowable Service. Proportionate Retirement Annuity is available at normal retirement age and one year of Allowable Service.

***Early Retirement*:**

Eligibility:

First hired before July 1, 1989:
Age 55 and three years of Allowable Service.
Any age with 30 years of Allowable Service.
Rule of 90: Age plus Allowable Service totals 90.

First hired after June 30, 1989:
Age 55 with three years of Allowable Service.

Retirement Amount:

First hired before July 1, 1989:
The greater of 1.2% of Average Salary for each of the first 10 years of Allowable Service and 1.7% of Average Salary for each subsequent year with reduction of 0.25% for each month the Member is under age 65 at time of retirement (age 62 if 30 years of Allowable Service). No reduction if age plus years of Allowable Service totals 90;

OR

1.7% of Average Salary for each year of Allowable Service assuming augmentation to age 65 at 3% per year and actuarial reduction for each month the Member is under age 65;

OR

for eligible Members, money purchase annuity equal to the actuarial equivalent of 220% of the Member's accumulated deductions plus interest thereon.

First hired after June 30, 1989:
1.7% of Average Salary for each year of Allowable Service assuming augmentation to age eligible for full Social Security retirement benefits at 3% per year and actuarial reduction for each month the Member is under the full Social Security benefit retirement age but not to exceed age 66.

Form of Payment: Life annuity.
Actuarially equivalent options are:
50%, 75% or 100% joint and survivor with bounce back feature without additional reduction.
15 year certain and life.
Guaranteed refund.

Benefit Increases: Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF). A Member who has been receiving a benefit for at least 12 full months as of the previous June 30 will receive a full increase. Members receiving benefits for at least one full month but less than 12 full months will receive a partial pro rata increase.

Members retired under laws in effect before July 1, 1973 receive an additional lump-sum payment from TRA each year. In 1989, this lump-sum payment was $25 times each full year of Allowable Service. In each following year, the lump-sum payment increases by the same percentage increase that is applied to regular annuities paid from MPRIF.

Members who terminate service after June 30, 1997 and whose benefits commence during the period July 2, 1997 through July 1, 2002 shall receive a percentage of the July 1, 1997 permanent increase as follows:

July 2, 1997 - July 1, 1999	50%
July 2, 1999 - July 1, 1999	40%
July 2, 1999 - July 1, 2001	30%
July 2, 2001 - July 1, 2001	20%
July 2, 2001 - July 1, 2002	10%

DISABILITY

Disability Benefit:

Eligibility:	Total and permanent disability before normal retirement age with three years of Allowable Service.
Amount:	Normal Retirement Benefit based on Allowable Service and Average Salary at disability without reduction for commencement before normal retirement age unless an optional annuity plan is selected. Payments stop at normal retirement age or the five year anniversary of the effective date of the disability benefit, whichever is later. Payments stop earlier if disability ceases or death occurs. Benefits may be reduced on resumption of partial employment. A Member who became disabled before July 1, 1997 whose benefit does not commence until after June 30, 1997 shall receive an actuarially equivalent increase to reflect the change from 5% to 6% in the post-retirement interest assumption.
Form of Payment:	Same as for retirement.
Benefit Increases:	Adjusted by TRA to provide same increase as MPRIF. Members who become disabled after June 30, 1997 and whose benefits commence during the period July 1, 1997 through July 1, 2002 shall receive a percentage of the July 1, 1997 permanent increase as follows:

July 2, 1997 - July 1, 1999	50%
July 2, 1999 - July 1, 1999	40%
July 2, 1999 - July 1, 2001	30%
July 2, 2001 - July 1, 2001	20%
July 2, 2001 - July 1, 2002	10%

***Retirement After Disability*:**

Eligibility:	Normal retirement age or the five year anniversary of the effective date of the disability benefit, whichever is later.
Amount:	Any optional annuity continues. Otherwise, the larger of the disability benefit paid before normal retirement age or the normal retirement benefit available at normal retirement age, or an actuarially equivalent optional annuity.
Benefit Increases:	Same as for retirement.

DEATH

***Surviving Spouse Optional Annuity*:**

Eligibility:	Member or former Member with three years of Allowable Service who dies before retirement benefits commence.
Amount:	Survivor's payment of the 100% joint and survivor benefit or an actuarial equivalent term certain annuity. If commencement is prior to age 65 (age 62 if 30 years of service), the benefit is reduced same as early retirement with half the applicable reduction factor used from age 55 to the actual commencement age. If no surviving spouse, then an actuarial equivalent dependent child benefit is paid to age 20 or for five years if longer. A survivor of a Member who terminated service before July 1, 1997 whose benefit does not commence until after June 30, 1997 shall receive an actuarially equivalent increase to reflect the change from 5% to 6% in the post-retirement interest assumption.

Benefit Increases: Same as for retirement.

Survivors of Members who terminate service and die after June 30, 1997 and whose benefits commence during the period July 2, 1997 through July 1, 2002 shall receive a percentage of the July 1, 1997 permanent increase as follows:

July 2, 1997 - July 1, 1999	50%
July 2, 1999 - July 1, 1999	40%
July 2, 1999 - July 1, 2001	30%
July 2, 2001 - July 1, 2001	20%
July 2, 2001 - July 1, 2002	10%

Refund of Contributions:

Eligibility: Member dies before receiving any retirement benefits and the surviving spouse optional annuity is not elected.

Amount: The excess of the Member's contributions over any disability benefits paid plus 5% interest compounded annually if death occurred before May 16, 1989 and 6% interest compounded annually if death occurred on or after May 16, 1989.

TERMINATION

Refund of Contributions:

Eligibility: Thirty days following termination of teaching service.

Amount: Member's contributions with 5% interest compounded annually if termination occurred before May 16, 1989 and 6% interest compounded annually if termination occurred on or after May 16, 1989. A deferred annuity may be elected in lieu of a refund.

***Deferred Benefit*:**

Eligibility:	Vested at date of termination. Current requirement is three years of Allowable Service.
Amount:	The greater of benefit computed under law in effect at termination and increased by the following percentage compounded annually: 0% before 7/1/71; 5% from 7/1/71 to 1/1/81; and 3% thereafter until January 1 of the year following attainment of age 55 and 5% thereafter until the annuity begins. Amount is payable as a normal or early retirement. A Member who terminated service before July 1, 1997 whose benefit does not commence until after June 30, 1997 shall receive an actuarially equivalent increase to reflect the change from 5% to 6% in the post-retirement interest assumption;

OR

for eligible former Members, money purchase annuity equal to the actuarial equivalent of 220% of the former Member's accumulated deductions plus interest thereon.

Members who terminate service after June 30, 1997 and whose benefits commence during the period July 2, 1997 through July 1, 2002 shall receive a percentage of the July 1, 1997 permanent increase as follows:

July 2, 1997 - July 1, 1999	50%
July 2, 1999 - July 1, 1999	40%
July 2, 1999 - July 1, 2001	30%
July 2, 2001 - July 1, 2001	20%
July 2, 2001 - July 1, 2002	10%

SUMMARY OF SIGNIFICANT CHANGES

No significant changes have been reflected in the valuation of the Fund.

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Teachers Retirement Association Fund

Schedule of Funding Progress

(dollars in thousands)

July 1, 2003

Actuarial Valuation Date	Actuarial Value of Assets (A)	Actuarial Accrued Liability (B)	Unfunded AAL (UAAL) (B)-(A)	Funded Ratio (A)/(B)	Actual Covered Payroll (Previous FY) (C)	UAAL as % of Covered Payroll ((B)-(A))/(C)
07/01/91	$ 5,614,924	$ 7,213,720	$ 1,598,796	77.84%	$ 1,943,375	82.27%
07/01/92	6,324,733	7,662,522	1,337,789	82.54%	1,989,624	67.24%
07/01/93	7,045,937	8,266,059	1,220,122	85.24%	2,065,881	59.06%
07/01/94	7,611,936	9,115,266	1,503,330	83.51%	2,150,300	69.91%
07/01/95	8,348,124	9,717,623	1,369,499	85.91%	2,204,693	62.12%
07/01/96	9,541,221	10,366,168	824,947	92.04%	2,268,390	36.37%
07/01/97	11,103,759	10,963,637	(140,122)	101.28%	2,359,011	-5.94%
07/01/98	12,727,546	12,046,312	(681,234)	105.66%	2,422,957	-28.12%
07/01/99	14,011,247	13,259,569	(751,678)	105.67%	2,625,254	-28.63%
07/01/00	15,573,151	14,802,441	(770,710)	105.21%	2,704,575	-28.50%
07/01/01	16,834,024	15,903,984	(930,040)	105.85%	2,812,000	-33.07%
07/01/02	17,378,994	16,503,099	(875,895)	105.31%	2,873,771	-30.48%
07/01/03	17,384,179	16,856,379	(527,800)	103.13%	2,952,887	-17.87%

Teachers Retirement Association Fund

Schedule of Employer Contributions

(dollars in thousands)

July 1, 2003

Year Ended June 30	Actuarially Required Contribution Rate (A)	Actual Covered Payroll (B)	Actual Member Contributions (C)	Annual Required Contributions [(A)*(B)]-(C)	Actual Employer Contributions[1]	Percentage Contributed
1991	13.11%	$ 1,943,375	$ 89,313	$ 165,463	$ 159,439	96.36%
1992	13.04%	1,989,624	91,506	167,941	162,370	96.68%
1993	13.13%	2,065,881	94,709	176,541	168,071	95.20%
1994	12.75%	2,150,300	100,803	173,360	171,855	99.13%
1995	14.73%	2,204,693	143,536	181,215	179,672	99.15%
1996	14.30%	2,268,390	148,051	176,329	184,495	104.63%
1997	12.78%	2,359,011	154,161	147,321	191,670	130.10%
1998	9.55% [2]	2,422,957	124,096	107,296	151,323	141.03%
1999	8.39% [2]	2,625,254	132,040	88,219	130,526	147.96%
2000	8.36% [2]	2,704,575	138,696	87,406	134,419	153.79%
2001	7.92% [2],[3]	2,812,000	145,075	77,635	139,799	180.07%
2002	7.85% [2]	2,873,771	152,331	73,260	142,222	194.13%
2003	7.57% [2],[4]	2,952,887	155,577	67,957	149,481	219.96%
2004	8.37% [2]					

(1) Includes contributions from other sources (if applicable.)

(2) Actuarially Required Contributions calculated according to parameters of GASB 25, using a 30-year amortization of the negative unfunded actuarial accrued liability.

(3) Actuarially Required Contribution Rate prior to change in Actuarial Assumptions and Asset Valuation Method is 7.31%.

(4) Actuarially Required Contribution Rate prior to change in Actuarial Assumptions is 8.11%.