

TEACHERS RETIREMENT ASSOCIATION FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1993

MILLIMAN & ROBERTSON, INC.



MILLIMAN & ROBERTSON, INC.

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December 7, 1993

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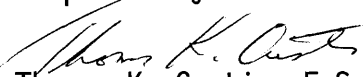
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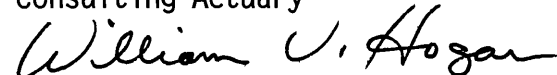
Pursuant to the terms of our Actuarial Services Contract, we have performed an actuarial valuation of the Fund as of July 1, 1993.

The results of our calculations are set forth in the following report, as are the actuarial assumptions upon which our calculations have been made. 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 on July 8, 1992.

Respectfully submitted,


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TEACHERS RETIREMENT ASSOCIATION FUND

REPORT HIGHLIGHTS (DOLLARS IN THOUSANDS)

	<u>07/01/92 Valuation</u>	<u>07/01/93 Valuation</u>
A. CONTRIBUTIONS (Table 11)		
1. Statutory Contributions - Chapter 353 % of Payroll	12.72%	12.68%
2. Required Contributions - Chapter 356 % of Payroll	13.13%	12.75%
3. Sufficiency (Deficiency): (A.1. - A.2.)	-0.41%	-0.07%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	\$6,324,733	\$7,045,937
b. Current Benefit Obligations (Table 8)	\$6,996,540	\$7,607,562
c. Funding Ratio: (a/b)	90.40%	92.62%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	\$6,324,733	\$7,045,937
b. Actuarial Accrued Liability (Table 9)	\$7,662,522	\$8,266,059
c. Funding Ratio: (a/b)	82.54%	85.24%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	\$9,524,675	\$10,349,382
b. Current and Expected Future Benefit Obligations	\$9,709,123	\$10,380,086
c. Funding Ratio: (a/b)	98.10%	99.70%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	65,557	65,268
b. Projected Annual Earnings	\$2,112,401	\$2,156,739
c. Average Annual Earnings (Actual \$)	\$32,222	\$33,044
d. Average Age	42.8	42.9
e. Average Service	12.3	12.4
2. Others		
a. Service Retirements (Table 4)	17,863	19,343
b. Disability Retirements (Table 5)	297	354
c. Survivors (Table 6)	1,049	1,113
d. Deferred Retirements (Table 7)	3,548	4,030
e. Terminated Other Non-vested (Table 7)	15,447	15,994
f. Total	38,204	40,834

TEACHERS RETIREMENT ASSOCIATION FUND

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:

- o 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 92.62%. The corresponding ratio for the prior year was 90.40%.
- o 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 1993 the ratio is 85.24%, which is an increase from the 1992 value of 82.54%.
- o The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 99.70% shows that the current statutory contributions are inadequate.

Asset Information (Tables 1 and 2)

Minnesota Statutes require that the asset value used for actuarial purposes recognize only a third of the unrealized gains and losses. This requirement exists because market values (which include all unrealized gain and losses) are typically volatile and can produce erratic changes in the contribution requirements from year to year.

The calculation of the Actuarial Value of Assets is shown in Table 1 on lines F1 to F6. It combines the cost value of the Assets Available for Benefits and one-third of the difference between the market value and cost value of those assets.

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 in accordance with Statement No. 5 of the Governmental Accounting Standards Board (GASB). Those requirements are:

- o For Active Members - 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.

- o For Non-active Members - the discounted value of benefits, including augmentation in cases where benefits have not commenced.

GASB Disclosure

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of the Governmental Accounting Standards Board (GASB). However, Statement No. 5 uses the terms "Actuarial Present Value of Credited Projected Benefits" and "Pension Benefit Obligation" rather than "Current Benefit Obligation".

The July 1, 1993 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table:

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	\$3,267,221,000
Current Employees	
Accumulated employee contributions including allocated investment income	\$2,036,442,000
Employer-financed vested	2,015,446,000
Employer-financed nonvested	288,453,000

Total Pension Benefit Obligation	\$7,607,562,000
Net Assets Available for Benefits at Cost	\$6,923,414,000
Total Benefit Obligation less Assets	\$684,148,000
Funded Ratio	91.01%

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 the 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.

The payments will increase 6.5% each year because that is the assumed rate of increase in payroll. Although the payment schedule will be adequate to amortize the existing unfunded, the lower payments in the earlier years will not be sufficient to cover the interest on the unfunded liability. After a few years, the annual payment will cover the interest and also repay a portion of the unfunded.

Sources 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 expectation. 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:

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

Table 11 shows the Plan has a contribution deficiency since the Statutory Contribution Rate is 12.68% compared to the Required Contribution Rate of 12.75%.

Changes in Actuarial Assumptions

The actuarial assumptions listed in Table 12 are the same as those used in the prior Valuation, however the allowance for expenses as part of the required contributions of Chapter 356 in Table 11 only reflect administrative expenses and not investment expenses. This reduced the required contribution by approximately .26% of payroll.

Changes in Plan Provisions

Death Benefit coverage was extended to active and former members less than age 50.

A temporary early retirement window providing enhanced benefits was enacted to be effective for those retiring between May 1993 and August 1993. Members who have at least 25 years of service and are age 55 or who have at least 1 year of service and are age 65 may elect to retire and receive an increase of .10% to the service credit accrual rate. The increased accrual rate will be applied to each year of service up to a maximum of 30 years.

TABLE 1

TEACHERS RETIREMENT ASSOCIATION FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1993

	<u>Market Value</u>	<u>Cost Value</u>
A. ASSETS		
1. Cash, Equivalents, Short-term Securities	\$61,151	\$61,151
2. Investments		
a. Fixed Income	1,165,767	1,132,594
b. Equity	3,004,690	2,670,295
c. Real Estate	0	0
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	3,038,859	3,038,859
4. Other	34,140	34,140
	-----	-----
B. TOTAL ASSETS	\$7,304,607	\$6,937,039
	=====	=====
C. AMOUNTS CURRENTLY PAYABLE	\$13,625	\$13,625
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	\$921,143	\$921,143
2. Employer Reserves	3,330,980	2,963,412
3. MPRIF Reserves	3,038,859	3,038,859
4. Non-MPRIF Reserves	0	0
	-----	-----
5. Total Assets Available for Benefits	\$7,290,982	\$6,923,414
	-----	-----
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	\$7,304,607	\$6,937,039
	=====	=====
F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS		
1. Cost Value of Assets Available for Benefits (D5)		\$6,923,414
2. Market Value (D5)	\$7,290,982	
3. Cost Value (D5)	6,923,414	

4. Market Over Cost: (F2-F3)	\$367,568	
5. 1/3 of Market Over Cost: (F4)/3		122,523

6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		\$7,045,937
		=====

TABLE 2

TEACHERS RETIREMENT ASSOCIATION FUND
CHANGE IN ASSETS AVAILABLE FOR BENEFITS
(DOLLARS IN THOUSANDS)
YEAR ENDING JUNE 30, 1993

	<u>Market Value</u>	<u>Cost Value</u>
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	\$6,493,217	\$6,240,491
B. OPERATING REVENUES		
1. Member Contributions	\$94,709	\$94,709
2. Employer Contributions	168,071	168,071
3. Investment Income	453,108	453,108
4. MPRIF Income	234,962	234,962
5. Net Realized Gain (Loss)	0	0
6. Other	2,347	2,347
7. Net Change in Unrealized Gain (Loss)	114,842	0
	-----	-----
8. Total Revenue	\$1,068,039	\$953,197
	-----	-----
C. OPERATING EXPENSES		
1. Service Retirements	\$249,123	\$249,123
2. Disability Benefits	3,893	3,893
3. Survivor Benefits	3,614	3,614
4. Refunds	4,750	4,750
5. Investment Expenses	5,579	5,579
6. Administrative Expenses	3,124	3,124
7. Other	191	191
	-----	-----
8. Total Disbursements	270,274	270,274
	-----	-----
D. OTHER CHANGES IN RESERVES	0	0
E. ASSETS AVAILABLE AT END OF PERIOD	\$7,290,982	\$6,923,414
	=====	=====

TABLE 3

TEACHERS RETIREMENT ASSOCIATION FUND

ACTIVE MEMBERS AS OF JUNE 30, 1993

AGE	YEARS OF SERVICE								ALL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	1,514	131							1,645
25-29	2,754	3,411	366						6,531
30-34	1,041	2,262	3,064	215	1				6,583
35-39	1,288	1,716	1,688	2,576	601				7,869
40-44	1,448	1,900	2,126	1,875	3,814	1,123			12,286
45-49	892	1,448	1,638	1,221	2,030	4,828	732		12,789
50-54	434	754	878	909	975	2,206	2,846	638	9,640
55-59	242	328	372	386	568	1,040	1,337	1,357	5,630
60-64	133	155	119	143	205	362	421	409	1,947
65+	59	64	24	20	30	55	38	58	348
ALL	9,805	12,169	10,275	7,345	8,224	9,614	5,374	2,462	65,268

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE								ALL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	14,381	23,304							15,092
25-29	11,899	22,972	27,883						18,578
30-34	10,412	21,741	28,847	32,560	24,110				23,611
35-39	10,674	21,890	29,690	33,388	38,698				26,775
40-44	9,480	20,418	30,626	35,465	39,581	41,339			31,053
45-49	9,448	18,478	30,988	35,410	40,159	43,157	44,741		35,328
50-54	8,007	16,633	29,204	35,040	41,004	45,100	45,446	46,310	38,575
55-59	5,972	12,350	24,641	31,921	39,455	45,487	46,339	47,933	39,734
60-64	7,422	7,762	23,886	28,926	39,582	45,010	47,126	48,122	37,544
65+	6,300	3,817	19,693	31,146	38,197	44,277	51,909	50,001	29,211
ALL	10,970	20,687	29,460	34,265	39,812	43,719	45,750	47,593	31,017

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	107	251	302	251	327	420	245	117	2,024

TABLE 4

TEACHERS RETIREMENT ASSOCIATION FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1993

AGE	YEARS RETIRED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50			2					2
50-54	20	7						27
55-59	872	763	18	1				1,654
60-64	803	2,094	1,058	4				3,959
65-69	190	1,387	2,120	475	1			4,173
70-74	11	234	1,627	1,177	204	1	1	3,255
75-79	3	18	203	1,505	733	83	1	2,546
80-84		2	9	82	1,589	218	55	1,955
85+				3	344	1,033	392	1,772
ALL	1,899	4,505	5,037	3,247	2,871	1,335	449	19,343

AVERAGE ANNUAL BENEFIT

AGE	YEARS RETIRED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50			12,811					12,812
50-54	14,765	12,874						14,276
55-59	21,732	16,798	12,802	4,053				19,349
60-64	18,355	18,372	17,406	17,226				18,110
65-69	13,860	13,895	16,703	10,289	12,607			14,910
70-74	10,102	13,114	13,815	13,152	7,549	12,629	12,691	13,120
75-79	4,175	8,072	12,131	13,159	11,078	4,606	11,973	12,153
80-84		1,778	3,956	11,500	10,756	5,239	4,693	9,961
85+				2,694	10,116	6,355	7,337	7,296
ALL	19,349	16,397	15,696	12,688	10,535	6,069	7,036	14,082

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS RETIRED

AGE	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
ALL	36,744	73,869	79,061	41,198	30,246	8,102	3,159	272,388

TABLE 5

TEACHERS RETIREMENT ASSOCIATION FUND

SURVIVORS AS OF JUNE 30, 1993

AGE	YEARS SINCE DEATH							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50	2	11	5	1				19
50-54	4	20	4	1	1	1		31
55-59	8	50	15	5	2	1		81
60-64	12	78	50	21	4	4	2	171
65-69	14	99	83	20	7	3	2	228
70-74	15	94	77	38	16	3	5	248
75-79	17	73	71	36	13	8	6	224
80-84	9	17	17	18	8	4	3	76
85+		7	4	4	8	5	7	35
ALL	81	449	326	144	59	29	25	1,113

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50	5,817	4,063	4,094	2,047				4,150
50-54	6,915	11,673	6,702	13,426	4,532	3,101		9,968
55-59	18,742	11,390	13,735	8,036	4,213	7,858		12,123
60-64	22,434	12,768	11,304	12,326	12,853	4,389	2,508	12,651
65-69	11,075	13,150	12,794	12,029	11,337	7,857	2,542	12,577
70-74	9,000	12,057	11,282	13,822	11,619	7,595	2,972	11,637
75-79	11,263	11,690	14,918	15,341	13,282	6,511	3,911	12,967
80-84	10,132	8,364	9,225	9,249	7,580	6,993	4,862	8,683
85+		10,699	4,547	6,563	5,048	7,989	6,613	7,028
ALL	12,731	11,914	12,219	12,676	10,227	6,720	4,373	11,767

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

AGE	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
ALL	1,031	5,349	3,983	1,825	603	195	109	13,097

TABLE 6

TEACHERS RETIREMENT ASSOCIATION FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1993

AGE	YEARS DISABLED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50	9	32	10	3				54
50-54	9	33	12	7	2			63
55-59	10	52	30	6	4	1		103
60-64	9	53	34	12	2	1		111
65-69	12	4	3	2	2			23
70-74								
75-79								
80-84								
85+								
ALL	49	174	89	30	10	2		354

AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50	6,745	6,193	5,588	17,000				6,774
50-54	14,147	9,241	7,924	11,253	3,115			9,721
55-59	17,653	15,372	9,722	7,807	7,594	5,937		13,114
60-64	12,964	15,285	11,888	16,414	9,137	8,839		14,010
65-69	15,188	12,874	10,220	5,021	11,096			12,898
70-74								
75-79								
80-84								
85+								
ALL	13,541	12,438	9,860	12,788	7,708	7,389		11,810

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS DISABLED

AGE	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
ALL	664	2,164	878	384	77	15		4,181

TABLE 7

TEACHERS RETIREMENT ASSOCIATION FUND

RECONCILIATION OF MEMBERS

		<u>Terminated</u>		
		<u>Deferred Retirement</u>	<u>Other Non-Vested</u>	
	<u>Actives</u>			
A.	ON JUNE 30, 1992	65,557	3,548	15,447
B.	ADDITIONS	6,180	910	3,611
C.	DELETIONS			
1.	Service Retirement	(1,679)	(245)	0
2.	Disability	0	0	0
3.	Death	(40)	(47)	0
4.	Terminated - Deferred	(4,062)	0	0
5.	Terminated - Refund	(663)	0	(929)
6.	Terminated - Other Non-Vested	0	0	(1,047)
7.	Returned as Active	0	(136)	(1,039)
8.	Transferred	(22)	0	0
D.	DATA ADJUSTMENTS	(3)	0	(49)
	Vested	49,137		
	Non-Vested	16,131		
E.	TOTAL ON JUNE 30, 1993	65,268	4,030	15,994

		Recipients		
		Retirement Annuitants	Disabled	Survivors
A.	ON JUNE 30, 1992	17,863	297	1,049
B.	ADDITIONS	1,923	73	144
C.	DELETIONS			
1.	Service Retirement	0	(19)	0
2.	Death	(431)	(18)	(14)
3.	Annuity Expired	(5)	0	(53)
4.	Returned as Active	0	(5)	0
D.	DATA ADJUSTMENTS	(7)	26	(13)
E.	TOTAL ON JUNE 30, 1993	19,343	354	1,113

TABLE 8

TEACHERS RETIREMENT ASSOCIATION FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1993

A.	CURRENT ASSETS (TABLE 1, F6)			\$7,045,937
B.	EXPECTED FUTURE ASSETS			
1.	Present Value of Expected Future Statutory Supplemental Contributions			\$1,189,418
2.	Present Value of Future Normal Costs			2,114,027
3.	Total Expected Future Assets			<u>\$3,303,445</u>
C.	TOTAL CURRENT AND EXPECTED FUTURE ASSETS			<u>\$10,349,382</u>
D.	CURRENT BENEFIT OBLIGATIONS	<u>Non-Vested</u>	<u>Vested</u>	<u>Total</u>
1.	Benefit Recipients			
a.	Retirement Annuities		\$2,945,863	\$2,945,863
b.	Disability Benefits		60,253	60,253
c.	Surviving Spouse and Child Benefits		113,922	113,922
2.	Deferred Retirements With Future Augmentation		123,053	123,053
3.	Former Members Without Vested Rights		24,130	24,130
4.	Active Members			
a.	Retirement Annuities	9,454	3,905,169	3,914,623
b.	Disability Benefits	190,481	0	190,481
c.	Survivor's Benefits	87,265	0	87,265
d.	Deferred Retirements	1,253	127,405	128,658
e.	Refund Liability Due to Death or Withdrawal	0	19,314	19,314
5.	Total Current Benefit Obligations	<u>\$288,453</u>	<u>7,319,109</u>	<u>\$7,607,562</u>
E.	EXPECTED FUTURE BENEFIT OBLIGATIONS			<u>\$2,772,524</u>
F.	TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			<u>\$10,380,086</u>
G.	CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			<u>\$561,625</u>
H.	CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			\$30,704

TABLE 9

TEACHERS RETIREMENT ASSOCIATION FUND
DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
AND SUPPLEMENTAL CONTRIBUTION RATE
(DOLLARS IN THOUSANDS)

JULY 1, 1993

	Actuarial Present Value of Projected Benefits <u>(1)</u>	Actuarial Present Value of Future Normal Costs <u>(2)</u>	Actuarial Accrued Liability <u>(3)=(1)-(2)</u>
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	\$6,428,989	\$1,693,575	\$4,735,414
b. Disability Benefits	311,580	125,051	186,529
c. Survivor's Benefit	139,296	53,231	86,065
d. Deferred Retirements	196,443	155,967	40,476
e. Refunds Due to Death or Withdrawal	36,558	86,203	(49,645)
	-----	-----	-----
f. Total	\$7,112,866	\$2,114,027	\$4,998,839
	-----	-----	-----
2. Deferred Retirements With Future Augmentation	123,053		123,053
3. Former Members Without Vested Rights	24,130		24,130
4. Annuitants in MPRIF	3,038,859		3,038,859
5. Recipients Not in MPRIF	81,178		81,178
	-----	-----	-----
6. Total	\$10,380,086	\$2,114,027	\$8,266,059
	=====	=====	=====
B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)			
1. AAL (A6)			\$8,266,059
2. Current Assets (Table 1, F6)			7,045,937

3. UAAL (B1-B2)			\$1,220,122
			=====
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE			
1. Present Value of Future Payrolls Through the Amortization Date of July 1, 2020			\$44,216,272
2. Supplemental Contribution Rate (B3/C1)			2.76%

TABLE 10

TEACHERS RETIREMENT ASSOCIATION FUND
 CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
 (DOLLARS IN THOUSANDS)
 YEAR ENDING JUNE 30, 1993

A.	UAAL AT BEGINNING OF YEAR	\$1,337,789
B.	CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1.	Normal Cost and Expenses	\$214,068
2.	Contribution	(262,780)
3.	Interest on A, B1 and B2	111,642

4.	Total (B1+B2+B3)	\$62,930

C.	EXPECTED UAAL AT END OF YEAR (A+B4)	\$1,400,719
D.	INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1.	Salary Increases	(\$197,313)
2.	Investment Return	(182,849)
3.	MPRIF Mortality	7,332
4.	Mortality of Other Benefit Recipients	408
5.	Other Items	161,549

6.	Total	(\$210,873)

E.	UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTION (C+D6)	\$1,189,846
F.	CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	30,276
G.	CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	0

H.	UAAL AT END OF YEAR (E+F+G)	\$1,220,122
		=====

TABLE 11

TEACHERS RETIREMENT ASSOCIATION FUND
DETERMINATION OF CONTRIBUTION SUFFICIENCY
(DOLLARS IN THOUSANDS)

JULY 1, 1993

	<u>Percent of Payroll</u>	<u>Dollar Amount</u>
A. STATUTORY CONTRIBUTIONS - CHAPTER 353		
1. Employee Contributions	4.52%	\$97,566
2. Employer Contributions	8.16%	176,071
3. Total	----- 12.68% =====	----- \$273,637 =====
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	7.92%	\$170,801
b. Disability benefits	0.57%	12,364
c. Survivors	0.25%	5,410
d. Deferred Retirement Benefits	0.71%	15,330
e. Refunds Due to Death or Withdrawal	0.39%	8,337
f. Total	----- 9.84% -----	----- \$212,242 -----
2. Supplemental Contribution Amortization by July 1, 2020 of UAAL	2.76%	59,526
3. Allowance for Expenses	0.15%	3,235
4. Total	----- 12.75% -----	----- \$275,003 -----
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	-0.07%	(\$1,366)

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1993
is \$2,156,739.

TEACHERS RETIREMENT ASSOCIATION FUND
SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: 8.5% per annum
	Post-Retirement: 5.0% per annum
Salary Increases:	Reported salary for prior fiscal year, with new hires annualized, increased 6.5% to current fiscal year and 6.5% annually for each future year.
Mortality:	Pre-Retirement:
	Male - 1971 Group Annuity Mortality Table set back eight years
	Female - 1971 Group Annuity Mortality Table set back eight years
	Post-Retirement:
	Male - Same as above
	Female - Same as above
	Post-Disability:
	Male - Same as above
	Female - Same as above
Retirement Age:	Age 62 or if over age 62, one year from valuation date. In addition, 45% of Basic Members and 30% of Coordinated Members are assumed to retire each year that they are eligible for the Rule of 90.
Separation:	Select and ultimate rates were based on plan experience as of June 30, 1989. Ultimate rates after the third year are shown in rate table. Select rates are as follows:

	<u>First Year</u>	<u>Second Year</u>	<u>Third Year</u>
Less than 35	.3	.15	.1
35-44	.25	.125	.08
45-60	.3	.15	.1

TABLE 12
(Continued)

TEACHERS RETIREMENT ASSOCIATION FUND
SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Disability:	Rates as shown in table.
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
Benefit Increases After Retirement:	Payment of earnings on retired reserves in excess of 5% accounted for by 5% post-retirement assumptions.
Special Consideration:	Married Members assumed to elect subsidized joint and survivor form of annuity as follows: <div style="margin-left: 40px;"> Males - 15% elect 50% J&S option 50% elect 100% J&S option Females - 10% elect 50% J&S option 10% elect 100% J&S option </div>
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:	Cost Value plus one-third Unrealized Gains or Losses.
Payment on the Unfunded Actuarial Accrued Liability:	A level percentage of payroll each year to the statutory amortization date assuming payroll increases of 6.5% per annum.

TABLE 12
(Continued)TEACHERS RETIREMENT ASSOCIATION FUND
SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Separations Expressed as the Number of Occurrences Per 10,000:

Age	Death		Withdrawal		Disability		Retirement	
	Male	Female	Male	Female	Male	Female	Male	Female
20	4	4	600	600	4	4	0	0
21	4	4	600	600	4	4	0	0
22	4	4	600	600	4	4	0	0
23	4	4	600	600	5	5	0	0
24	4	4	600	600	5	5	0	0
25	5	5	600	600	5	5	0	0
26	5	5	600	600	5	5	0	0
27	5	5	600	600	5	5	0	0
28	5	5	600	600	5	5	0	0
29	5	5	580	580	5	5	0	0
30	5	5	565	565	6	6	0	0
31	6	6	540	540	6	6	0	0
32	6	6	520	520	6	6	0	0
33	6	6	500	500	6	6	0	0
34	7	7	480	480	6	6	0	0
35	7	7	440	440	6	6	0	0
36	7	7	370	370	7	7	0	0
37	8	8	330	330	7	7	0	0
38	8	8	280	280	8	8	0	0
39	9	9	240	240	8	8	0	0
40	9	9	210	210	8	8	0	0
41	10	10	195	195	9	9	0	0
42	10	10	185	185	9	9	0	0
43	11	11	175	175	10	10	0	0
44	12	12	160	160	10	10	0	0
45	13	13	145	145	11	11	0	0
46	14	14	130	130	12	12	0	0
47	15	15	115	115	13	13	0	0
48	16	16	100	100	14	14	0	0
49	18	18	85	85	16	16	0	0

TABLE 12
(Continued)

TEACHERS RETIREMENT ASSOCIATION FUND
SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Separations Expressed as the Number of Occurrences Per 10,000:

Age	Death		Withdrawal		Disability		Retirement	
	Male	Female	Male	Female	Male	Female	Male	Female
50	20	20	70	70	17	17	0	0
51	23	23	55	55	19	19	0	0
52	26	26	40	40	22	22	0	0
53	29	29	25	25	26	26	0	0
54	33	33	10	10	30	30	0	0
55	38	38	0	0	36	36	0	0
56	42	42	0	0	41	41	0	0
57	47	47	0	0	47	47	0	0
58	53	53	0	0	52	52	0	0
59	59	59	0	0	58	58	0	0
60	65	65	0	0	63	63	0	0
61	71	71	0	0	69	69	0	0
62	78	78	0	0	0	0	10,000	10,000
63	85	85	0	0	0	0	0	0
64	93	93	0	0	0	0	0	0
65	100	100	0	0	0	0	0	0
66	109	109	0	0	0	0	0	0
67	119	119	0	0	0	0	0	0
68	131	131	0	0	0	0	0	0
69	144	144	0	0	0	0	0	0
70	159	159	0	0	0	0	0	0

TABLE 3A
BASIC

TEACHERS RETIREMENT ASSOCIATION FUND

ACTIVE MEMBERS AS OF JUNE 30, 1993

AGE	YEARS OF SERVICE								ALL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25									
25-29									
30-34									
35-39									
40-44									
45-49									
50-54						2	4	8	14
55-59						3	19	153	175
60-64						3	9	56	68
65+						1		13	14
ALL						9	32	230	271

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE								ALL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25									
25-29									
30-34									
35-39									
40-44									
45-49									
50-54						51,930	49,474	37,830	43,171
55-59						25,897	38,829	45,977	44,857
60-64						40,413	52,841	42,468	43,750
65+						45,400		42,293	42,515
ALL						38,688	44,101	44,631	44,371

PRIOR FISCAL YEAR EARNINGS (IN THOUSANDS) BY YEARS OF SERVICE

AGE	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
ALL						348	1,411	10,265	12,024

TABLE 4A
BASIC

TEACHERS RETIREMENT ASSOCIATION FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1993

AGE	YEARS RETIRED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								
50-54								
55-59	154	170	11					335
60-64	65	402	398	2				867
65-69	20	154	652	205				1,031
70-74		32	379	417	110	1	1	940
75-79	1	3	41	437	347	60	1	890
80-84			1	28	514	106	50	699
85+					87	259	239	585
ALL	240	761	1,482	1,089	1,058	426	291	5,347

AVERAGE ANNUAL BENEFIT

AGE	YEARS RETIRED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								
50-54								
55-59	31,334	26,160	13,733					28,131
60-64	27,291	26,105	22,652	18,660				24,592
65-69	22,182	22,866	24,485	15,924				22,497
70-74		19,025	21,404	19,116	10,083	12,629	12,691	18,965
75-79	457	9,093	19,271	19,234	13,277	5,088	11,973	15,896
80-84			3,892	16,928	14,230	7,007	4,987	12,567
85+					13,901	9,362	9,856	10,239
ALL	29,348	25,098	22,967	18,506	13,459	8,182	9,037	18,831

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS RETIRED

AGE	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
ALL	7,044	19,100	34,037	20,153	14,240	3,486	2,630	100,689

TABLE 5A
BASIC

TEACHERS RETIREMENT ASSOCIATION FUND

SURVIVORS AS OF JUNE 30, 1993

AGE	YEARS SINCE DEATH							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50			1	1				2
50-54		1	1		1	1		4
55-59	1	8	5	2	1	1		18
60-64	2	20	13	14	3	4	2	58
65-69	2	31	26	9	2	3	2	75
70-74	2	23	16	14	9	3	5	72
75-79	2	17	22	18	3	4	6	72
80-84	1	5	5	6	2	2	2	23
85+		4	1		2	3	5	15
ALL	10	109	90	64	23	21	22	339

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50			12,354	2,047				7,201
50-54		14,434	16,530	11,326	4,532	3,101		9,650
55-59	18,681	17,302	22,648	17,517	7,032	7,858		17,793
60-64	19,584	18,145	14,816	14,859	11,560	4,389	2,508	14,827
65-69	13,686	18,287	15,007	15,388	11,036	7,857	2,542	15,649
70-74	29,258	17,453	18,677	18,417	13,527	6,099	2,972	16,271
75-79	12,380	14,011	26,787	18,408	16,157	7,368	3,911	17,848
80-84	19,112	6,673	8,937	12,507	9,040	4,270	5,129	9,091
85+		10,934	10,052		4,142	8,995	7,371	8,394
ALL	18,761	16,508	18,532	16,373	11,518	6,447	4,343	15,335

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH								
AGE	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
ALL	188	1,799	1,668	1,048	265	135	96	5,199

TABLE 6A
BASIC

TEACHERS RETIREMENT ASSOCIATION FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1993

AGE	YEARS DISABLED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								
50-54								
55-59	1	6	1					8
60-64		5	5	4	1	1		16
65-69	2				1			3
70-74								
75-79								
80-84								
85+								
ALL	3	11	6	4	2	1		27

AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								
50-54								
55-59	34,763	33,753	47,539	18,114	12,954			35,603
60-64		35,455	24,039	34,172	13,162	8,839		28,510
65-69	20,770				17,500			19,680
70-74								
75-79								
80-84								
85+								
ALL	25,434	34,528	27,956	34,172	15,332	8,839		29,631

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS DISABLED

AGE	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
ALL	76	380	168	137	31	9		800

TABLE 11A
BASIC

TEACHERS RETIREMENT ASSOCIATION FUND
DETERMINATION OF CONTRIBUTION SUFFICIENCY
(DOLLARS IN THOUSANDS)

JULY 1, 1993

	<u>Percent of Payroll</u>	<u>Dollar Amount</u>
A. STATUTORY CONTRIBUTIONS - CHAPTER 353		
1. Employee Contributions	8.50%	\$1,089
2. Employer Contributions	12.14%	1,555
	-----	-----
3. Total	20.64%	\$2,644
	=====	=====
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	12.93%	\$1,656
b. Disability benefits	0.92%	118
c. Survivors	0.64%	82
d. Deferred Retirement Benefits	1.12%	144
e. Refunds Due to Death or Withdrawal	1.28%	164
	-----	-----
f. Total	16.89%	\$2,164
	-----	-----

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1993
is \$12,809.

TEACHERS RETIREMENT ASSOCIATION FUND

SUMMARY OF PLAN PROVISIONS

Eligibility:	<p>A public school or community college 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.</p> <p>No community college teacher with more than three years of Allowable Service who was first employed before 7/1/89 is a Member if that person elects coverage under Sec. 354B.</p>
Contributions	
Member:	8.5% of salary.
Employer:	12.14% 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, and any payments made in lieu of employer paid fringe benefits or expenses.
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:	<p>First hired before July 1, 1989:</p> <p>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.</p>
---------------------------------------	--

TEACHERS RETIREMENT ASSOCIATION FUND

SUMMARY OF PLAN PROVISIONS

First hired after June 30, 1989:

The greater of age 65 or the age eligible for full Social Security retirement benefits 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

2% of Average Salary for each of the first 10 years of Allowable Service and 2.5% 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 age 62 if 30 years of Allowable Service. No reduction if age plus years of Allowable Service totals 90;

OR

2.5% 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.

First hired after June 30, 1989:

2.5% of Average Salary for each year of Allowable Service assuming augmentation to the 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.

TEACHERS RETIREMENT ASSOCIATION FUND

SUMMARY OF PLAN PROVISIONS

Form of Payment:

Life annuity.
Actuarially equivalent options are:
50% 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.

DISABILITY

Disability Benefit

Eligibility:

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

TEACHERS RETIREMENT ASSOCIATION FUND

SUMMARY OF PLAN PROVISIONS

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. 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 disabled five years, the surviving spouse and children are eligible for survivor benefits.
Form of Payment:	Same as for retirement.
Benefit Increases:	Adjusted by TRA to provide same increase as MPRIF.
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.
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TEACHERS RETIREMENT ASSOCIATION FUND

SUMMARY OF PLAN PROVISIONS

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 who dies before retirement or disability benefits commence with three years of Allowable Service.
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.
Benefit Increases:	Same as for retirement.

TEACHERS RETIREMENT ASSOCIATION FUND

SUMMARY OF PLAN PROVISIONS

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:	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.

TEACHERS RETIREMENT ASSOCIATION FUND

SUMMARY OF PLAN PROVISIONS

SUMMARY OF SIGNIFICANT CHANGES

1. Upon Member's or former Member's death, immediate commencement of the survivor annuity or the actuarial equivalent term certain annuity with half of the applicable early retirement reduction factor applied to ages prior to 55. If no surviving spouse, then dependent child benefit paid to later of age 20 or five years.
2. An early retirement incentive has been offered to teachers who meet the following criteria:
 - a. Have 25 years of combined service credit or are age 65 with one year of combined service credit.
 - b. Are immediately eligible to retire.
 - c. Are at least age 55.
 - d. Retire after May 16, 1993 and before August 1, 1993 (January 31, 1994 in some cases).

A Member who chooses to retire under this incentive will receive an additional pension of .10% times years of Allowable Service (maximum 30 years) and will receive employer-paid hospital, medical and dental insurance under conditions and limitations as specified by law.

TABLE 3B
COORDINATED

TEACHERS RETIREMENT ASSOCIATION FUND

ACTIVE MEMBERS AS OF JUNE 30, 1993

AGE	YEARS OF SERVICE								ALL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	1,514	131							1,645
25-29	2,754	3,411	366						6,531
30-34	1,041	2,262	3,064	215	1				6,583
35-39	1,288	1,716	1,688	2,576	601				7,869
40-44	1,448	1,900	2,126	1,875	3,814	1,123			12,286
45-49	892	1,448	1,638	1,221	2,030	4,828	732		12,789
50-54	434	754	878	909	975	2,204	2,842	630	9,626
55-59	242	328	372	386	568	1,037	1,318	1,204	5,455
60-64	133	155	119	143	205	359	412	353	1,879
65+	59	64	24	20	30	54	38	45	334
ALL	9,805	12,169	10,275	7,345	8,224	9,605	5,342	2,232	64,997

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE								ALL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	14,381	23,304							15,092
25-29	11,899	22,972	27,883						18,578
30-34	10,412	21,741	28,847	32,560	24,110				23,611
35-39	10,674	21,890	29,690	33,388	38,698				26,775
40-44	9,480	20,418	30,626	35,465	39,581	41,339			31,053
45-49	9,448	18,478	30,988	35,410	40,159	43,157	44,741		35,328
50-54	8,007	16,633	29,204	35,040	41,004	45,095	45,440	46,421	38,569
55-59	5,972	12,350	24,641	31,921	39,455	45,546	46,448	48,194	39,573
60-64	7,422	7,762	23,886	28,926	39,582	45,049	47,002	49,028	37,322
65+	6,300	3,817	19,693	31,146	38,197	44,257	51,909	52,234	28,654
ALL	10,970	20,687	29,460	34,265	39,812	43,724	45,759	47,907	30,962

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	107	251	302	251	327	419	244	106	2,012

TABLE 4B
COORDINATED

TEACHERS RETIREMENT ASSOCIATION FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1993

AGE	YEARS RETIRED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50			2					2
50-54	20	7						27
55-59	718	593	7	1				1,319
60-64	738	1,692	660	2				3,092
65-69	170	1,233	1,468	270	1			3,142
70-74	11	202	1,248	760	94			2,315
75-79	2	15	162	1,068	386	23		1,656
80-84		2	8	54	1,075	112	5	1,256
85+				3	257	774	153	1,187
ALL	1,659	3,744	3,555	2,158	1,813	909	158	13,996

AVERAGE ANNUAL BENEFIT

AGE	YEARS RETIRED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50			12,811					12,812
50-54	14,765	12,874						14,276
55-59	19,673	14,114	11,340	4,053				17,118
60-64	17,568	16,535	14,242	15,791				16,292
65-69	12,881	12,775	13,246	6,011	12,607			12,420
70-74	10,102	12,178	11,511	9,880	4,583			10,746
75-79	6,034	7,867	10,324	10,674	9,101	3,351		10,141
80-84		1,778	3,964	8,685	9,095	3,566	1,759	8,511
85+				2,694	8,834	5,348	3,403	5,846
ALL	17,902	14,629	12,664	9,752	8,828	5,079	3,351	12,267

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS RETIRED								
AGE	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
ALL	29,699	54,771	45,021	21,045	16,005	4,617	530	171,689

TABLE 5B
COORDINATED

TEACHERS RETIREMENT ASSOCIATION FUND

SURVIVORS AS OF JUNE 30, 1993

AGE	YEARS SINCE DEATH							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50	2	11	4					17
50-54	4	19	3	1				27
55-59	7	42	10	3	1			63
60-64	10	58	37	7	1			113
65-69	12	68	57	11	5			153
70-74	13	71	61	24	7			176
75-79	15	56	49	18	10	4		152
80-84	8	12	12	12	6	2	1	53
85+		3	3	4	6	2	2	20
ALL	71	340	236	80	36	8	3	774

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50	5,817	4,063	2,029					3,792
50-54	6,915	11,527	3,426	2,099				9,595
55-59	18,751	10,264	9,279	1,716	1,394			10,503
60-64	23,004	10,914	10,071	7,260	16,730			11,533
65-69	10,640	10,808	11,785	9,281	11,457			11,071
70-74	5,883	10,309	9,342	11,141	9,167	4,487		9,715
75-79	11,114	10,986	9,589	12,273	12,420	5,655		10,655
80-84	9,009	9,069	9,346	7,620	7,093	9,715	4,327	8,506
85+		10,385	2,712	6,563	5,350	6,480	4,717	6,002
ALL	11,881	10,441	9,812	9,577	9,402	6,877	4,587	10,184

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

AGE	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
ALL	844	3,550	2,316	766	339	55	14	7,882

TABLE 6B
COORDINATED

TEACHERS RETIREMENT ASSOCIATION FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1993

AGE	YEARS DISABLED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50	9	32	10	3				54
50-54	9	33	12	7	2			63
55-59	9	46	29	6	4	1		95
60-64	9	48	29	8	1			95
65-69	10	4	3	2	1			20
70-74								
75-79								
80-84								
85+								
ALL	46	163	83	26	8	1		327

AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50	6,745	6,193	5,588	17,000				6,774
50-54	14,147	9,241	7,924	11,253	3,115			9,721
55-59	15,752	12,974	8,418	4,788	4,355	5,937		10,893
60-64	12,964	13,184	9,793	7,535	5,112			11,568
65-69	14,072	12,874	10,220	5,021	4,693			11,881
70-74								
75-79								
80-84								
85+								
ALL	12,766	10,947	8,552	8,801	4,183	5,938		10,244

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS DISABLED

AGE	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
ALL	587	1,784	710	229	34	6		3,350

TABLE 11B
COORDINATED

TEACHERS RETIREMENT ASSOCIATION FUND
DETERMINATION OF CONTRIBUTION SUFFICIENCY
(DOLLARS IN THOUSANDS)

JULY 1, 1993

	<u>Percent of Payroll</u>	<u>Dollar Amount</u>
A. STATUTORY CONTRIBUTIONS - CHAPTER 353		
1. Employee Contributions	4.50%	\$96,477
2. Employer Contributions	8.14%	174,516
3. Total	----- 12.64%	----- \$270,993
	=====	=====
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	7.89%	\$169,145
b. Disability benefits	0.57%	12,246
c. Survivors	0.25%	5,328
d. Deferred Retirement Benefits	0.71%	15,186
e. Refunds Due to Death or Withdrawal	0.38%	8,173
f. Total	----- 9.80%	----- \$210,078
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Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1993
is \$2,143,930.

TEACHERS RETIREMENT ASSOCIATION FUND COORDINATED

SUMMARY OF PLAN PROVISIONS

Eligibility:	<p>A public school, community college or state university 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.</p> <p>No community college teacher or state university teacher first employed <u>after June 30, 1989</u> is a Member except for purposes of Social Security coverage. No community college or state university teacher first employed <u>before July 1, 1989</u> is a Member except for purposes of Social Security coverage if that person elects coverage under Sec. 354B.</p>
Contributions	
Member:	4.5% of salary.
Employer:	8.14% 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 re paid into the fund.
Salary:	Compensation used for contribution purposes excluding lump-sum annual or sick leave payments, severance payments, and any payments made in lieu of employer paid fringe benefits or expenses.
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:	<p>First hired before July 1, 1989:</p> <p>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.</p>
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TEACHERS RETIREMENT ASSOCIATION FUND

SUMMARY OF PLAN PROVISIONS

First hired after June 30, 1989:

The greater of age 65 or the age eligible for full Social Security retirement benefits 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% of Average Salary for each of the first 10 years of Allowable Service and 1.5% 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

1.5% 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.

First hired after June 30, 1989:

1.5% 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.

TEACHERS RETIREMENT ASSOCIATION FUND

SUMMARY OF PLAN PROVISIONS

Form of Payment:	Life annuity. Actuarially equivalent options are: 50% 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 the greater of \$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.

DISABILITY

Disability Benefit

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

SUMMARY OF PLAN PROVISIONS

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 earlier if disability ceases or death occurs. Benefits may be reduced on resumption of partial employment.

Form of Payment: Same as for retirement.

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

Retirement After Disability

Eligibility: Normal retirement age.

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 who dies before retirement benefits commence with three years of Allowable Service.

TEACHERS RETIREMENT ASSOCIATION FUND

SUMMARY OF PLAN PROVISIONS

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.

Benefit Increases: Same as for retirement.

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.

TEACHERS RETIREMENT ASSOCIATION FUND

SUMMARY OF PLAN PROVISIONS

Deferred Benefit

Eligibility:	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.

SUMMARY OF SIGNIFICANT CHANGES

1. Upon Member's or former Member's death, immediate commencement of the survivor annuity or the actuarial equivalent term certain annuity with half of the applicable early retirement reduction factor applied to ages prior to 55. If no surviving spouse, then dependent child benefit paid to later of age 20 or five years.
2. An early retirement incentive has been offered to teachers who meet the following criteria:
 - a. Have 25 years of combined service credit or are age 65 with one year of combined service credit.
 - b. Are immediately eligible to retire.
 - c. Are at least age 55.
 - d. Retire after May 16, 1993 and before August 1, 1993 (January 31, 1994 in some cases).

A Member who chooses to retire under this incentive will receive an additional pension of .10% times years of Allowable Service (maximum 30 years) and will receive employer-paid hospital, medical and dental insurance under conditions and limitations as specified by law.