

R E C E I V E D

NOV 13 1998

LEGISLATIVE REFERENCE LIBRARY
STATE OFFICE BUILDING
ST. PAUL, MN 55155

Duluth Teachers' Retirement Fund
ACTUARIAL VALUATION REPORT

July 1, 1998



MILLIMAN & ROBERTSON, INC.

Actuaries & Consultants

Internationally WOODROW MILLIMAN

Suite 400, 15800 Bluemound Road, Brookfield, Wisconsin 53005-6069

Telephone: 414/784-2250

Fax: 414/784-7287

November 10, 1998

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

RE: Duluth Teachers' Retirement 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, 1998.

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 Duluth Teachers' Retirement Fund 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.

Respectfully submitted,

MILLIMAN & ROBERTSON, INC.

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

William V. Hogan, F.S.A., M.A.A.A.
Consulting Actuary

TKC/WVH/bh

Duluth Teachers' Retirement Fund

Table of Contents

	<u>Page</u>
REPORT HIGHLIGHTS	1
COMMENTARY	
Purpose	2
Report Highlights	2
Asset Information	2
Actuarial Balance Sheet	3
GASB Disclosure	3
Actuarial Cost Method	4
Sources of Actuarial Gains and Losses	4
Contribution Sufficiency	4
Changes in Actuarial Assumptions	5
Changes in Plan Provisions	5
ASSET INFORMATION	
Table 1 - Statement of Plan Net Assets	6
Table 2 - Statement of Change in Plan Net Assets	7
MEMBERSHIP DATA	
Table 3 - Active Members	8
Table 4 - Service Retirements	9
Table 5 - Survivors	10
Table 6 - Disability Retirements	11
Table 7 - Reconciliation of Members	12
Table 8 - Actuarial Balance Sheet	13
Table 9 - Determination of Unfunded Actuarial Accrued Liability (UAAL) and Supplemental Contribution Rate	14
Table 10 - Changes in Unfunded Actuarial Accrued Liability (UAAL)	15
Table 11 - Determination of Contribution Sufficiency	16

Duluth Teachers' Retirement Fund

Table of Contents

(Continued)

	<u>Page</u>
ACTUARIAL ASSUMPTIONS	
Table 12 - Summary of Actuarial Assumptions and Methods	17
Table 14 - Schedule of Funding Progress	21
Table 15 - Schedule of Employer Contributions	22

OLD

MEMBERSHIP DATA

Table 3A - Active Members	23
Table 4A - Service Retirements	24
Table 5A - Survivors	25
Table 6A - Disability Retirements	26

FUNDING STATUS

Table 11A - Determination of Contribution Sufficiency	27
---	----

PLAN PROVISIONS

Table 13A - Summary of Plan Provisions	28
--	----

NEW

MEMBERSHIP DATA

Table 3B - Active Members	34
Table 4B - Service Retirements	35
Table 5B - Survivors	36
Table 6B - Disability Retirements	37

FUNDING STATUS

Table 11B - Determination of Contribution Sufficiency	38
---	----

PLAN PROVISIONS

Table 13B - Summary of Plan Provisions	39
--	----

Duluth Teachers' Retirement Fund

Report Highlights

(dollars in thousands)

	07/01/97 Valuation	07/01/98 Valuation
A. CONTRIBUTIONS (Table 11)		
1. Statutory Contributions - Chapter 354A % of Payroll	12.30%	12.30%
2. Required Contributions - Chapter 356 % of Payroll	12.87%	10.24%
3. Sufficiency (Deficiency): (A.1. - A.2.)	-0.57%	2.06%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	\$170,059	\$187,482
b. Current Benefit Obligations (Table 8)	\$186,992	\$186,918
c. Funding Ratio: (a/b)	90.94%	100.30%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	\$170,059	\$187,482
b. Actuarial Accrued Liability (Table 9)	\$197,820	\$197,078
c. Funding Ratio: (a/b)	85.97%	95.13%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	\$223,676	\$242,665
b. Current and Expected Future Benefit Obligations	\$231,551	\$229,865
c. Funding Ratio: (a/b)	96.60%	105.57%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	1,416	1,437
b. Projected Annual Earnings	\$47,923	\$48,158
c. Average Annual Earnings (Actual \$)	\$33,844	\$33,513
d. Average Age	44.0	44.4
e. Average Service	11.2	11.1
2. Others		
a. Service Retirements (Table 4)	823	849
b. Survivors (Table 5)	49	50
c. Disability Retirements (Table 6)	7	11
d. Deferred Retirements (Table 7)	151	155
e. Terminated Other Non-vested (Table 7)	588	563
f. Total	1,618	1,628

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 100.30%. The corresponding ratio for the prior year was 90.94%
- 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 1998 the ratio is 95.13%, which is an increase from the 1997 value of 85.97%.
- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 105.57% verifies that the current statutory contributions are sufficient.

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 E1 to E6. 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.

Reference to the Minnesota Post-Retirement Investment Fund (MPRIF) is for purposes of consistency. The fund does not participate in the MPRIF and, therefore, where the term MPRIF appears, there will be a value of zero.

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:

- 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.
- 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 superseded by Statement No. 25. Tables 14 and 15 of this report have been added to fulfill the new 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.

The payments will increase 5.00% 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.

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.

For this year, there is a source of significant gain which deserves special mention. The valuation assumes that each year salaries of teachers will increase according to the scale in Table 12. As of this writing, the Duluth teachers union is negotiating a new contract with the Board. Since the old contract expired over one year prior to the valuation date, the reported salaries do not reflect any increases in pay. This situation has produced significant gains in the valuation results for this year. We have not provided any special treatment for this gain component in our report. It is likely that these gains will be followed by losses if a new contract provides for retroactive pay increases.

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 12.30% compared to the Required Contribution Rate of 10.24%.

Changes in Plan Benefits

Consistent with results from recent experience studies, a change in the Actuarial Equivalence Table for optional benefit forms was adopted.

From:		To:	
Mortality:	1971 GAM Male, with 8 year setback.	Participant:	70% 1983 GAM Male with two year setback. 30% 1983 GAM Female with one year setback.
Interest:	5.0% compounded annually.	Beneficiary:	30% 1983 GAM Male with two year setback. 70% 1983 GAM Female with one year setback.
		Interest:	6.37% compounded annually.

N:\CLIENT\06MTD\REPORTS\COMM\NTRY.DOC

TABLE 1

Duluth Teachers' Retirement Fund

Statement of Plan Net Assets*(dollars in thousands)*

JULY 1, 1998

	Market Value	Cost Value
A. ASSETS IN TRUST		
1. Cash, Equivalents, Short-term Securities	\$19,047	\$19,047
2. Fixed Income	85,470	83,859
3. Equity	139,521	83,721
4. Real Estate and Mortgage Loans	3,154	3,154
5. Equity in MPRIF	0	0
6. Invested Securities Lending Collateral	49,486	49,486
7. Other	516	516
Subtotal	<u>\$297,194</u>	<u>\$239,783</u>
B. ASSETS RECEIVABLE	12,562	12,562
C. LIABILITIES		
1. Invested Securities Lending Collateral	(49,486)	(49,486)
2. Other	(34,514)	(34,514)
Subtotal	<u>(84,000)</u>	<u>(84,000)</u>
D. NET ASSETS HELD IN TRUST FOR PENSION BENEFITS		
1. MPRIF Reserves	0	0
2. Member Reserves	23,608	23,608
3. Other Non-MPRIF Reserves	202,148	144,737
4. Total Assets Available for Benefits	<u>\$225,756</u>	<u>\$168,345</u>
<hr/>		
E. DETERMINATION OF ACTUARIAL VALUE OF ASSETS		
1. Cost Value of Assets Available for Benefits (D4)		\$168,345
2. Market Value (D4)	\$225,756	
3. Cost Value (D4)	168,345	
4. Market Over Cost: (E2-E3)	<u>\$57,411</u>	
5. One-third of Market Over Cost: (E4)/3		19,137
6. Actuarial Value of Assets (E1+E5) (Same as "Current Assets")		<u>\$187,482</u>

TABLE 2

Duluth Teachers' Retirement Fund

Statement of Change In Plan Net Assets*(dollars in thousands)*

YEAR ENDING JUNE 30, 1998

	<u>Market Value</u>	<u>Cost Value</u>
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	\$199,442	\$155,368
B. ADDITIONS		
1. Member Contributions	\$2,664	\$2,664
2. Employer Contributions	2,725	2,725
3. Contributions From Other Sources	486	486
4. MPRIF Income	0	0
5. Net Investment Income		
a. Interest and Dividends	5,964	5,964
b. Net Realized Gain (Loss)	12,148	12,148
c. Net Change in Unrealized Gain (Loss)	13,336	0
d. Investment Expenses	(880)	(880)
Net Subtotal	30,568	17,232
6. Other	80	80
7. Total Additions	<u>\$36,523</u>	<u>\$23,186</u>
C. OPERATING EXPENSES		
1. Service Retirements paid from MPRIF	\$0	\$0
2. Service Retirements paid from plan assets	9,175	9,175
2. Disability Benefits	96	96
3. Survivor Benefits	473	473
4. Refunds	125	125
6. Administrative Expenses	340	340
7. Other	0	0
8. Total Disbursements	<u>\$10,209</u>	<u>\$10,209</u>
D. OTHER CHANGES IN RESERVES	0	0
E. ASSETS AVAILABLE AT END OF PERIOD	<u>\$225,756</u>	<u>\$168,345</u>

TABLE 3

DULUTH TEACHERS' RETIREMENT FUND**ACTIVE MEMBERS AS OF JUNE 30, 1998**

Age	Years of Service								ALL
	<u><1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30+</u>	
<25	38	9	0	0	0	0	0	0	47
25-29	56	60	5	0	0	0	0	0	121
30-34	24	41	41	6	0	0	0	0	112
35-39	25	29	35	47	1	0	0	0	137
40-44	30	38	47	65	23	3	0	0	206
45-49	27	46	49	89	40	48	30	0	329
50-54	12	19	21	38	30	34	76	26	256
55-59	12	8	15	17	16	21	41	39	169
60-64	6	3	3	4	12	13	6	4	51
65+	3	2	0	1	0	2	0	1	9
ALL	233	255	216	267	122	121	153	70	1,437

AVERAGE ANNUAL EARNINGS

Age	Years of Service								ALL
	<u><1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30+</u>	
<25	4,932	23,375	0	0	0	0	0	0	8,464
25-29	3,356	22,101	28,893	0	0	0	0	0	13,706
30-34	3,907	26,233	28,699	36,905	0	0	0	0	22,923
35-39	4,728	18,450	30,116	40,270	47,632	0	0	0	26,625
40-44	3,593	27,187	30,576	40,341	45,790	47,782	0	0	31,052
45-49	6,569	22,372	31,022	44,695	45,288	42,528	51,031	0	36,742
50-54	6,546	16,116	34,930	44,105	43,198	47,505	45,839	47,460	40,715
55-59	3,254	14,199	25,127	39,291	41,500	47,576	47,160	49,877	39,878
60-64	2,816	4,783	45,285	27,501	38,724	39,021	49,545	48,099	34,093
65+	1,274	5,315	0	36,139	0	47,274	0	47,391	21,392
ALL	4,338	22,173	30,457	41,963	43,746	44,635	47,356	48,842	31,906

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

Age	<u><1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30+</u>	ALL
All	1,010	5,654	6,578	11,204	5,337	5,400	7,245	3,418	45,848

TABLE 4

DULUTH TEACHERS' RETIREMENT FUND**SERVICE RETIREMENTS AS OF JUNE 30, 1998**

Age	YEARS RETIRED							ALL
	≤1	1-4	5-9	10-14	15-19	20-24	25+	
<50	0	2	0	0	0	0	0	2
50-54	1	2	1	0	0	0	0	4
55-59	36	32	2	0	0	0	0	70
60-64	34	46	95	0	0	0	0	175
65-69	6	29	118	54	0	0	0	207
70-74	1	4	35	88	28	0	0	156
75-79	1	0	3	32	46	10	1	93
80-84	0	0	1	1	27	28	4	61
85+	0	0	0	0	0	32	49	81
ALL	79	115	255	175	101	70	54	849

AVERAGE ANNUAL BENEFIT

Age	YEARS RETIRED							ALL
	≤1	1-4	5-9	10-14	15-19	20-24	25+	
<50	0	7,073	0	0	0	0	0	7,073
50-54	7,643	2,574	14,225	0	0	0	0	6,754
55-59	25,409	18,038	11,716	0	0	0	0	21,648
60-64	17,372	11,060	14,147	0	0	0	0	13,962
65-69	8,063	8,638	12,938	9,361	0	0	0	11,261
70-74	7,679	17,149	12,765	10,861	4,239	0	0	10,240
75-79	25,032	0	7,603	7,625	7,954	4,107	8,937	7,610
80-84	0	0	6,465	919	7,420	6,483	3,951	6,640
85+	0	0	0	0	0	7,466	9,198	8,514
ALL	20,179	12,386	13,272	9,750	6,781	6,593	8,805	11,461

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS RETIRED

Age	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
All	1,594	1,424	3,384	1,706	684	461	475	9,730

DULUTH TEACHERS' RETIREMENT FUND**SURVIVORS AS OF JUNE 30, 1998**

Age	YEARS SINCE DEATH							ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	0	0	1	0	0	0	1
50-54	0	0	0	0	0	0	0	0
55-59	0	0	2	0	0	0	0	2
60-64	0	1	5	0	0	0	0	6
65-69	0	0	4	6	1	0	0	11
70-74	0	0	1	6	4	1	0	12
75-79	0	0	1	0	7	0	1	9
80-84	0	0	0	0	3	0	0	3
85+	0	0	0	0	1	4	2	7
ALL	0	1	13	13	16	5	3	51

AVERAGE ANNUAL BENEFIT

Age	YEARS SINCE DEATH							ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	0	0	3,462	0	0	0	3,462
50-54	0	0	0	0	0	0	0	0
55-59	0	0	16,195	0	0	0	0	16,195
60-64	0	16,878	13,849	0	0	0	0	14,354
65-69	0	0	8,822	10,420	11,536	0	0	9,940
70-74	0	0	15,763	14,760	10,452	4,113	0	12,520
75-79	0	0	1,287	0	7,962	0	6,587	7,068
80-84	0	0	0	0	9,417	0	0	9,417
85+	0	0	0	0	9,033	7,963	6,500	7,698
ALL	0	16,878	11,844	11,888	9,148	7,193	6,529	10,339

TOTAL ANNUAL BENEFIT (ACTUAL DOLLARS) BY YEARS SINCE DEATH

Age	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	ALL
All	0	16,878	153,972	154,544	146,368	35,965	19,587	527,289

DULUTH TEACHERS' RETIREMENT FUND**DISABILITY RETIREMENTS AS OF JUNE 30, 1998**

Age	YEARS DISABLED							ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	0	0	0	0	0	0	0
50-54	1	1	2	1	0	0	0	5
55-59	1	0	1	0	0	0	0	2
60-64	1	0	0	0	0	1	0	2
65-69	0	0	1	0	0	0	0	1
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	3	1	4	1	0	1	0	10

AVERAGE ANNUAL BENEFIT

Age	YEARS DISABLED							ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	0	0	0	0	0	0	0
50-54	1,108	9,189	9,988	9,171	0	0	0	7,889
55-59	5,510	0	12,146	0	0	0	0	8,828
60-64	2,517	0	0	0	0	5,547	0	4,032
65-69	0	0	16,681	0	0	0	0	16,681
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	3,045	9,189	12,201	9,171	0	5,547	0	8,185

TOTAL ANNUAL BENEFIT (ACTUAL DOLLARS) BY YEARS DISABLED

Age	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	ALL
All	9,135	9,189	48,804	9,171	0	5,547	0	81,850

TABLE 7

Duluth Teachers' Retirement Fund

Reconciliation Of Members

	Actives	Terminated	
		Deferred Retirement	Other Non-Vested
A. ON JUNE 30, 1997	1,416	151	588
B. ADDITIONS	198	128	0
C. DELETIONS			
1. Service Retirement	(34)	(5)	0
2. Disability	(1)	(3)	0
3. Death	0	0	0
4. Terminated - Deferred	(128)	0	0
5. Terminated - Refund	(13)	(128)	0
6. Terminated - Other Non-Vested	0	0	0
7. Returned as Active	0	(1)	0
8. Transferred to Other Fund	0	0	0
D. DATA ADJUSTMENTS	(1)	13	(25)
Vested	1,002		
Non-Vested	435		
E. TOTAL ON JUNE 30, 1998	1,437	155	563

	Retirement Annuitants	Recipients	
		Disabled	Survivors
A. ON JUNE 30, 1997	823	7	49
B. ADDITIONS	50	4	4
C. DELETIONS			
1. Service Retirement	0	0	0
2. Death	(27)	0	(3)
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	0
D. DATA ADJUSTMENTS	3	0	0
E. TOTAL ON JUNE 30, 1998	849	11	50

TABLE 8

Duluth Teachers' Retirement Fund

Actuarial Balance Sheet*(dollars in thousands)*

JULY 1, 1998

A. CURRENT ASSETS (TABLE 1, E6)				\$187,482
B. EXPECTED FUTURE ASSETS				
1. Present Value of Expected Future Statutory Supplemental Contributions (See Table 11)				\$22,396
2. Present Value of Future Normal Costs				32,787
3. Total Expected Future Assets				<u>\$55,183</u>
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS				<u>\$242,665</u>
D. CURRENT BENEFIT OBLIGATIONS	<u>Non-Vested</u>	<u>Vested</u>	<u>Total</u>	
1. Benefit Recipients				
a. Retirement Annuities		\$97,201	\$97,201	
b. Disability Benefits		745	745	
c. Surviving Spouse and Child Benefits		5,140	5,140	
2. Deferred Retirements with Future Augmentation		3,922	3,922	
3. Former Members without Vested Rights		391	391	
4. Active Members				
a. Retirement Annuities	242	73,286	73,528	
b. Disability Benefits	1,711	0	1,711	
c. Survivor's Benefits	1,104	0	1,104	
d. Deferred Retirements	25	2,602	2,627	
e. Refund Liability Due to Death or Withdrawal	0	549	549	
5. Total Current Benefit Obligations	<u>\$3,082</u>	<u>\$183,836</u>	<u>\$186,918</u>	
E. EXPECTED FUTURE BENEFIT OBLIGATIONS				<u>\$42,947</u>
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS				<u>\$229,865</u>
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)				(\$564)
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)				(\$12,800)

TABLE 9

Duluth Teachers' Retirement Fund

**Determination Of Unfunded Actuarial Accrued Liability (UAAL)
And Supplemental Contribution Rate**
(dollars in thousands)

JULY 1, 1998

	Actuarial Present Value of Projected Benefits (1)	Actuarial Present Value of Future Normal Costs (2)	Actuarial Accrued Liability (3)=(1)-(2)
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	\$112,882	\$26,687	\$86,195
b. Disability Benefits	2,785	1,005	1,780
c. Survivor's Benefit	1,742	632	1,110
d. Deferred Retirements	3,905	2,844	1,061
e. Refunds Due to Death or Withdrawal	1,152	1,619	(467)
f. Total	<u>\$122,466</u>	<u>\$32,787</u>	<u>\$89,679</u>
2. Deferred Retirements With Future Augmentation	3,922		3,922
3. Former Members Without Vested Rights	391		391
4. Annuitants in MPRIF	0		0
5. Recipients Not in MPRIF	<u>103,086</u>		<u>103,086</u>
6. Total	<u>\$229,865</u>	<u>\$32,787</u>	<u>\$197,078</u>
B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)			
1. AAL (A6)			\$197,078
2. Current Assets (Table 1, E6)			<u>187,482</u>
3. UAAL (B1-B2)			<u>\$9,596</u>
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE			
1. Present Value of Future Payrolls Through the Amortization Date of July 1, 2020			\$734,237
2. Supplemental Contribution Rate (B3/C1)			1.31%

TABLE 10

Duluth Teachers' Retirement Fund

Changes In Unfunded Actuarial Accrued Liability (UAAL)
(dollars in thousands)

YEAR ENDING JUNE 30, 1998

A. UAAL AT BEGINNING OF YEAR	\$27,761
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	\$4,398
2. Contribution	(5,389)
3. Interest on A, B1 and B2	<u>2,318</u>
4. Total (B1+B2+B3)	<u>\$1,327</u>
C. EXPECTED UAAL AT END OF YEAR (A+B4)	\$29,088
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	(\$6,718)
2. Investment Return	(2,956)
3. MPRIF Mortality	0
4. Mortality of Other Benefit Recipients	(1,501)
5. Other Items	<u>(6,109)</u>
6. Total	<u>(\$17,284)</u>
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTION (C+D6)	\$11,804
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	(2,208)
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	<u>0</u>
H. UAAL AT END OF YEAR (E+F+G)	<u><u>\$9,596</u></u>

* Gross asset gain of \$7,486 offset by \$4,530 of excess assets allocated for 1/1/99
'excess earnings' COLA to existing retirees and beneficiaries.

TABLE 11

Duluth Teachers' Retirement Fund

Determination Of Contribution Sufficiency
(dollars in thousands)

JULY 1, 1998

	Percent of Payroll	Dollar Amount
A. STATUTORY CONTRIBUTIONS - CHAPTER 354A		
1. Employee Contributions	5.50%	\$2,649
2. Employer Contributions	5.79%	2,788
3. Additional State Contribution*	1.01%	486
4. Total	12.30%	\$5,923
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	6.72%	\$3,234
b. Disability benefits	0.24%	115
c. Survivors	0.16%	75
d. Deferred Retirement Benefits	0.71%	344
e. Refunds Due to Death or Withdrawal	0.39%	190
f. Total	8.22%	\$3,958
2. Supplemental Contribution Amortization by July 1, 2020 of UAAL	1.31%	631
3. Allowance for Expenses	0.71%	342
4. Total	10.24%	\$4,931
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) [A3-B4]	2.06%	\$992

Note: Projected Annual Payroll for Fiscal Year Beginning on JULY 1, 1998 is \$48,158.

* Additional State Contribution is a level dollar amount which implies a decreasing percentage of payroll.

Duluth Teachers' Retirement Fund

Summary of Actuarial Assumptions and Methods

<i>Interest:</i>	Pre-Retirement: 8.5% per annum Post-Retirement: 8.5% per annum
<i>Salary Increases:</i>	Graded from 8.0% to 5.25%. The graded rates consist of a 5% inflation component and varying levels of merit and productivity increases.
<i>Mortality:</i>	Pre-Retirement: Male - 1983 GAM (Males -4) Female - 1983 GAM (Females -3) Post-Retirement: Male - 1983 GAM (Males -2) Female - 1983 GAM (Females -1) Post-Disability: Male - 1977 RRB Female - 1977 RRB
<i>Retirement Age:</i>	Age-related from 15% to 80% for the old plan and age-related from 10% to 80% for the new plan. In addition, 40% of the Members are assumed to retire each year that they are eligible for Rule of 90.
<i>Separation:</i>	Graded rates shown in rate table.
<i>Disability:</i>	Rates as shown in rate table.
<i>Expenses:</i>	Prior year administrative expenses expressed as percentage of prior year payroll.
<i>Return of Contributions:</i>	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.

TABLE 12
(Continued)

<i>Family Composition:</i>	80% of Members are assumed to be married. Female is three years younger than male.				
<i>Social Security:</i>	N/A				
<i>Benefit Increases After Retirement:</i>	N/A				
<i>Special Consideration:</i>	<p>Annual 2% increase for annuitants is accounted for by using a 6.5% post-retirement interest rate. Members in the Old Plan are assumed to receive their retirement benefits from the New Plan. Members who terminated under the Old Plan are assumed to take refund under the New Plan.</p> <p>Married Members assumed to elect subsidized joint and survivor form of annuity as follows:</p> <table> <tr> <td>Males -</td><td>30% elect 50% J&S option 55% elect 100% J&S option</td></tr> <tr> <td>Females -</td><td>30% elect 50% J&S option 20% elect 100% J&S option</td></tr> </table>	Males -	30% elect 50% J&S option 55% elect 100% J&S option	Females -	30% elect 50% J&S option 20% elect 100% J&S option
Males -	30% elect 50% J&S option 55% elect 100% J&S option				
Females -	30% elect 50% J&S option 20% elect 100% J&S option				
<i>Actuarial Cost Method:</i>	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.				
<i>Asset Valuation Method:</i>	Cost Value plus one-third Unrealized Gains or Losses.				
<i>Payment on the Unfunded Actuarial Accrued Liability:</i>	A level percentage of payroll each year to the statutory amortization date assuming payroll increases of 5% per annum.				

TABLE 12
(Continued)

Duluth Teachers' Retirement Fund

Summary of Actuarial Assumptions and Methods

Separation Expressed as Number of Occurrences Per 10,000:

<u>Age</u>	<u>Death</u>		<u>Withdrawal</u>		<u>Disability</u>		<u>Retirement</u>		<u>Salary Increases</u>
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Old</u>	<u>New</u>	
20	3	2	2,000	1,500	4	4	0	0	8.00%
21	3	2	1,931	1,360	4	4	0	0	8.00
22	4	2	1,731	1,220	4	4	0	0	8.00
23	4	2	1,532	1,080	5	5	0	0	7.90
24	4	2	1,332	940	5	5	0	0	7.80
25	4	2	1,132	800	5	5	0	0	7.70
26	4	2	932	660	5	5	0	0	7.60
27	4	2	732	520	5	5	0	0	7.50
28	4	3	703	500	5	5	0	0	7.40
29	5	3	673	480	5	5	0	0	7.30
30	5	3	643	460	6	6	0	0	7.20
31	5	3	612	440	6	6	0	0	7.10
32	5	3	582	420	6	6	0	0	7.00
33	6	3	552	400	6	6	0	0	6.90
34	6	4	522	380	6	6	0	0	6.80
35	6	4	491	360	6	6	0	0	6.70
36	7	4	461	340	7	7	0	0	6.60
37	7	4	430	320	7	7	0	0	6.50
38	8	5	409	300	8	8	0	0	6.40
39	9	5	389	280	8	8	0	0	6.30
40	9	5	368	260	8	8	0	0	6.20
41	10	6	347	240	9	9	0	0	6.10
42	10	6	325	220	9	9	0	0	6.00
43	11	7	304	210	10	10	0	0	5.90
44	12	7	282	200	10	10	0	0	5.80
45	14	8	260	190	11	11	0	0	5.70
46	15	8	237	180	12	12	0	0	5.60
47	17	9	214	170	13	13	0	0	5.50
48	19	10	191	160	14	14	0	0	5.45
49	22	11	167	150	16	16	0	0	5.40

TABLE 12
(Continued)

Duluth Teachers' Retirement Fund

Summary of Actuarial Assumptions and Methods

Separation Expressed as Number of Occurrences Per 10,000:

<u>Age</u>	<u>Death</u>		<u>Withdrawal</u>		<u>Disability</u>		<u>Retirement</u>		<u>Salary Increases</u>
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Old</u>	<u>New</u>	
50	25	12	143	140	17	17	0	0	5.35%
51	28	14	118	118	19	19	0	0	5.30
52	31	15	92	92	22	22	0	0	5.25
53	35	16	67	67	26	26	0	0	5.25
54	39	18	40	40	30	30	0	0	5.25
55	43	19	13	13	36	36	1,500	1,000	5.25
56	48	21	0	0	41	41	1,500	1,000	5.25
57	52	23	0	0	47	47	1,500	1,000	5.25
58	57	25	0	0	52	52	1,500	1,000	5.25
59	61	28	0	0	58	58	1,500	1,000	5.25
60	66	31	0	0	63	63	1,500	1,000	5.25
61	71	34	0	0	69	69	4,000	2,000	5.25
62	77	38	0	0	76	76	4,000	2,000	5.25
63	84	42	0	0	84	84	4,000	2,000	5.25
64	92	47	0	0	93	93	4,000	2,000	5.25
65	101	52	0	0	0	0	4,000	2,000	5.25
66	111	58	0	0	0	0	5,000	4,000	5.25
67	124	64	0	0	0	0	5,000	4,000	5.25
68	139	71	0	0	0	0	5,000	4,000	5.25
69	156	78	0	0	0	0	5,000	4,000	5.25
70	176	87	0	0	0	0	5,000	4,000	5.25

TABLE 14

Duluth Teachers' Retirement Fund

SCHEDULE OF FUNDING PROGRESS
(dollars in thousands)

Actuarial Valuation Date	Actuarial Value of Assets (A)	Actuarial Accrued Liability (AAL) (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	105,087	117,582	12,495	89.37%	42,297	29.54%
07/01/92	116,492	124,140	7,648	93.84%	42,884	17.83%
07/01/93	130,856	132,700	1,844	98.61%	43,282	4.26%
07/01/94	133,632	137,042	3,410	97.51%	43,109	7.91%
07/01/95	142,852	173,965	31,113	82.12%	46,528	66.87%
07/01/96	157,007	189,518	32,511	82.85%	44,870	72.46%
07/01/97	170,059	197,820	27,761	85.97%	46,770	59.36%
07/01/98	187,482	197,078	9,596	95.13%	47,064	20.39%

TABLE 15

Duluth Teachers' Retirement Fund
SCHEDULE OF EMPLOYER CONTRIBUTIONS
(dollars in thousands)

Year Ended June 30	Actuarially Required Contribution Rate (A)	Actual Covered Payroll (B)	Actual Member Contributions (C)	Annual Required Contribution [(A) x (B)] - (C)	Actual Employer Contribution*	Percentage Contributed
1991	10.70%	42,297	2,043	2,483	2,449	98.63%
1992	11.09%	42,884	2,124	2,632	2,483	94.34%
1993	11.42%	43,282	2,126	2,817	2,506	88.96%
1994	10.21%	43,109	2,230	2,171	2,496	114.97%
1995	10.36%	46,528	2,144	2,676	2,694	100.67%
1996	13.23%	44,870	2,570	3,366	2,598	77.18%
1997	13.60%	46,770	2,644	3,717	2,708	72.85%
1998	12.87%	47,064	2,664	3,393	3,211	94.64%

* Includes contributions from other sources (if applicable).

**TABLE 3A
OLD**

DULUTH TEACHERS' RETIREMENT FUND
ACTIVE MEMBERS AS OF JUNE 30, 1998

Age	Years of Service								ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30+</u>	
<25	0	0	0	0	0	0	0	0	0
25-29	0	0	0	0	0	0	0	0	0
30-34	0	0	0	0	0	0	0	0	0
35-39	0	0	0	0	0	0	0	0	0
40-44	0	0	0	2	19	3	0	0	24
45-49	0	0	0	3	28	47	30	0	108
50-54	0	0	1	1	24	33	76	26	161
55-59	0	1	0	2	12	21	41	39	116
60-64	0	0	0	0	8	13	6	4	31
65+	0	0	0	0	0	2	0	1	3
ALL	0	1	1	8	91	119	153	70	443

AVERAGE ANNUAL EARNINGS

Age	Years of Service								ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30+</u>	
<25	0	0	0	0	0	0	0	0	0
25-29	0	0	0	0	0	0	0	0	0
30-34	0	0	0	0	0	0	0	0	0
35-39	0	0	0	0	0	0	0	0	0
40-44	0	0	0	47,460	46,173	47,782	0	0	46,481
45-49	0	0	0	41,958	45,467	42,406	51,031	0	45,583
50-54	0	0	18,283	43,753	42,302	47,479	45,839	47,460	45,726
55-59	0	35,375	0	35,141	42,140	47,576	47,160	49,877	47,321
60-64	0	0	0	0	36,332	39,021	49,545	48,099	41,535
65+	0	0	0	0	0	47,274	0	47,391	47,313
ALL	0	35,375	18,283	41,854	43,538	44,573	47,356	48,842	45,867

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

Age	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30+</u>	ALL
All	0	35	18	334	3,961	5,304	7,245	3,418	20,319

**TABLE 4A
OLD**

DULUTH TEACHERS' RETIREMENT FUND

AS OF JUNE 30, 1998

Age	YEARS RETIRED							ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	1	0	0	0	0	0	1
50-54	1	0	1	0	0	0	0	2
55-59	12	16	1	0	0	0	0	29
60-64	10	34	39	0	0	0	0	83
65-69	0	6	28	20	0	0	0	54
70-74	0	0	3	44	28	0	0	75
75-79	0	0	0	15	40	10	1	66
80-84	0	0	0	1	26	28	4	59
85+	0	0	0	0	0	32	49	81
ALL	23	57	72	80	94	70	54	450

AVERAGE ANNUAL BENEFIT

Age	YEARS RETIRED							ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	9,592	0	0	0	0	0	9,592
50-54	7,643	0	14,225	0	0	0	0	10,934
55-59	17,880	17,674	12,681	0	0	0	0	17,587
60-64	12,111	8,358	13,461	0	0	0	0	11,208
65-69	0	4,146	10,887	6,679	0	0	0	8,580
70-74	0	0	4,592	8,997	4,239	0	0	7,045
75-79	0	0	0	7,702	7,461	4,107	8,937	7,030
80-84	0	0	0	919	7,131	6,483	3,951	6,503
85+	0	0	0	0	0	7,466	9,198	8,514
ALL	14,927	10,551	12,090	8,074	6,410	6,593	8,805	8,891

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS RETIRED

Age	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	ALL
All	343	601	870	645	602	461	475	4,000

**TABLE 5A
OLD**

DULUTH TEACHERS' RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1998

Age	YEARS SINCE DEATH							ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	0	0	1	0	0	0	1
50-54	0	0	0	0	0	0	0	0
55-59	0	0	2	0	0	0	0	2
60-64	0	0	1	0	0	0	0	1
65-69	0	0	0	2	1	0	0	3
70-74	0	0	0	1	4	1	0	6
75-79	0	0	0	0	6	0	1	7
80-84	0	0	0	0	3	0	0	3
85+	0	0	0	0	1	4	2	7
ALL	0	0	3	4	15	5	3	30

AVERAGE ANNUAL BENEFIT

Age	YEARS SINCE DEATH							ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	0	0	3,462	0	0	0	3,462
50-54	0	0	0	0	0	0	0	0
55-59	0	0	16,195	0	0	0	0	16,195
60-64	0	0	9,150	0	0	0	0	9,150
65-69	0	0	0	7,743	11,536	0	0	9,007
70-74	0	0	0	19,754	10,452	4,113	0	10,946
75-79	0	0	0	0	7,006	0	6,587	6,946
80-84	0	0	0	0	9,417	0	0	9,417
85+	0	0	0	0	9,033	7,963	6,500	7,698
ALL	0	0	13,847	9,676	8,844	7,193	6,529	8,949

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

Age	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	ALL
All	0	0	41,541	38,704	132,660	35,965	19,587	268,470

DULUTH TEACHERS' RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1998

Age	YEARS DISABLED							ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	0	0	0	0	0	0	0
50-54	0	0	0	1	0	0	0	1
55-59	0	0	0	0	0	0	0	0
60-64	0	0	0	0	0	1	0	1
65-69	0	0	0	0	0	0	0	0
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	0	0	0	1	0	1	0	2

AVERAGE ANNUAL BENEFIT

Age	YEARS DISABLED							ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	0	0	0	0	0	0	0
50-54	0	0	0	9,171	0	0	0	9,171
55-59	0	0	0	0	0	0	0	0
60-64	0	0	0	0	0	5,547	0	5,547
65-69	0	0	0	0	0	0	0	0
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	0	0	0	9,171	0	5,547	0	7,359

TOTAL ANNUAL BENEFIT (ACTUAL DOLLARS) BY YEARS DISABLED

Age	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	<u>ALL</u>
All	0	0	0	9,171	0	5,547	0	14,718

Duluth Teachers' Retirement Fund

Determination Of Contribution Sufficiency

(dollars in thousands)

JULY 1, 1998

	<u>Percent of Payroll</u>	<u>Dollar Amount</u>
A. STATUTORY CONTRIBUTIONS - CHAPTER 353		
1. Employee Contributions	5.50%	\$1,174
2. Employer Contributions	5.79%	1,236
3. Total	<u>11.29%</u>	<u>\$2,410</u>
 B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	6.28%	\$1,341
b. Disability benefits	0.19%	40
c. Survivors	0.15%	31
d. Deferred Retirement Benefits	0.88%	187
e. Refunds Due to Death or Withdrawal	<u>0.51%</u>	<u>108</u>
f. Total	<u>8.01%</u>	<u>\$1,707</u>

Note: Projected Annual Payroll for Fiscal Year Beginning on JULY 1, 1998 is \$21,339.

Duluth Teachers' Retirement Fund
Summary of Plan Provisions

GENERAL

<i>Eligibility:</i>	A licensed teacher who is employed by the Duluth Public Schools, and eligible licensed staff at Lake Superior College, who have elected to retain their membership in the DTRFA. Also includes any employees of the Retirement Fund and certain part-time employees licensed by the State Department of Education. Employees in the Old Plan are those first hired before July 1, 1981.
<i>Contributions:</i>	
<i>Member:</i>	5.5% of salary.
<i>Employer:</i>	5.79% of salary. (In addition, the State will contribute \$486,000 to the DTRFA plans each year on October 1.)
<i>Credited Service:</i>	Earned while employed in a covered position and employee contributions are deducted. Credit is granted for service less than a legal school year on a pro rata basis.
<i>Salary:</i>	Annual contract salary.
<i>Average Salary:</i>	Average of the five highest years of annual salary.

RETIREMENT

Normal Retirement Benefit:

<i>Eligibility:</i>	Age 60 and one year of Credited Service.
----------------------------	--

Amount: The greater of
1.45% of Average Salary for each year of Credited Service
or
the New Plan Benefit.

Early Retirement Benefit:

Eligibility: Age 55 and five years of Credited Service.
Rule of 90: Age plus Credited Service totals 90.

Amount: The greater of
1.45% of Average Salary for each year of Credited
Service with reduction of 0.25% for each month the
Member is under age 60. No reduction if age plus years
of Credited Service totals 90.
or
the New Plan Benefit.

Form of Payment: Life annuity. Actuarially equivalent options are:

5, 10, 15 or 20 year certain and life.
50% or 100% joint and survivor with bounce back
feature without additional reduction.
Other equivalent options approved by the Board.

Benefit Increases: Annual Cost-of-Living Adjustment (COLA):
Increase all benefits by 2% each January 1. An additional
increase will be allowed when the 5-year average rate of
return of the fund exceeds the interest rate assumption of
the plan, currently 8.5%. To be eligible for a COLA, a
retiree or beneficiary must have received a payment for at
least 12 months as of the adjustment date.

Members retired under laws in effect before June 30, 1971 receive an additional lump-sum payment each year. In 1989 this lump-sum payment is the greater of \$25 times each full year of Credited Service or the difference between \$400 times each full year of Credited Service and the sum of the benefits paid from any Minnesota public pension plan plus cash payments from the Social Security Administration for the fiscal year July 1, 1988 through June 30, 1989. In each following year, the lump sum will increase by the same increase that is applied to regular annuities.

DISABILITY

Disability Benefit:

<i>Eligibility:</i>	Totally and permanently disabled as a teacher before the age of 60 with five years of Credited Service.
<i>Amount:</i>	Normal Retirement Benefit based on Credited Service and Average Salary at disability date without reduction for early commencement. Amount is reduced for Workers' Compensation. Payment stops at age 60 or earlier if disability ceases or death occurs.
<i>Form of Payment:</i>	Same as for retirement.
<i>Benefit Increases:</i>	Same as for retirement.

DEATH

Return of Contributions I:

<i>Eligibility:</i>	Death while active.
<i>Amount:</i>	Two times regular contributions accumulated with 5% interest if death occurred before May 16, 1989 or 6% interest if death occurred on or after May 16, 1989.

Return of Contributions II:

<i>Eligibility:</i>	Death of Member who terminated employment after 10 years of service.
<i>Amount:</i>	Regular contributions accumulated with 5% interest if death occurred before May 16, 1989 or 6% interest if death occurred on or after May 16, 1989.

Return of Contributions III:

<i>Eligibility:</i>	Death of a retired or disabled Member whose benefits have commenced in the form of a life annuity or the death of a survivor of a retired or disabled Member under a joint and survivor option.
<i>Amount:</i>	Excess of regular contributions accumulated with 5% interest if death occurred before May 16, 1989 or 6% interest if death occurred on or after May 16, 1989 over total benefits paid.

Surviving Spouse Benefit

Optional Annuity I

<i>Eligibility:</i>	Death of active Member with 10 years of Credited Service.
<i>Amount:</i>	In lieu of Return of Contributions I, an annuity to surviving spouse equivalent to 120% of the value of what would have been refunded.

Optional Annuity II

<i>Eligibility:</i>	Death of active Member who is age 50 with 10 years of Credited Service. If the Member dies before age 55, benefits commence when Member would have been age 55.
<i>Amount:</i>	In lieu of Return of Contributions I or Surviving Spouse Optional Annuity I, spouse receives survivor portion of the joint and 100% contingent annuity the Member could have elected if terminated.

TERMINATION

Refund of Employee Contributions:

<i>Eligibility:</i>	Termination from teaching service.
<i>Amount:</i>	Member's contributions with 5% interest compounded annually if termination occurred before May 16, 1989 and 6% interest if termination occurred on or after May 16, 1989. A deferred annuity may be elected in lieu of a refund if the Member has 10 years of Credited Service.

Deferred Annuity:

Eligibility: Ten years of Credited Service.

Amount: Benefit computed under law in effect at termination and increased by the following annual percentage: 3% 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.

TABLE 3B
NEW

DULUTH TEACHERS' RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1998

Age	Years of Service								ALL
	<u><1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30+</u>	
<25	38	9	0	0	0	0	0	0	47
25-29	56	60	5	0	0	0	0	0	121
30-34	24	41	41	6	0	0	0	0	112
35-39	25	29	35	47	1	0	0	0	137
40-44	30	38	47	63	4	0	0	0	182
45-49	27	46	49	86	12	1	0	0	221
50-54	12	19	20	37	6	1	0	0	95
55-59	12	7	15	15	4	0	0	0	53
60-64	6	3	3	4	4	0	0	0	20
65+	3	2	0	1	0	0	0	0	6
ALL	233	254	215	259	31	2	0	0	994

AVERAGE ANNUAL EARNINGS

Age	Years of Service								ALL
	<u><1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30+</u>	
<25	4,932	23,375	0	0	0	0	0	0	8,464
25-29	3,356	22,101	28,893	0	0	0	0	0	13,706
30-34	3,907	26,233	28,699	36,905	0	0	0	0	22,923
35-39	4,728	18,450	30,116	40,270	47,632	0	0	0	26,625
40-44	3,593	27,187	30,576	40,114	43,972	0	0	0	29,017
45-49	6,569	22,372	31,022	44,793	44,888	48,351	0	0	32,424
50-54	6,546	16,116	35,763	44,115	46,802	48,419	0	0	32,226
55-59	3,254	11,174	25,127	39,846	39,585	0	0	0	23,589
60-64	2,816	4,783	45,285	27,501	43,513	0	0	0	22,558
65+	1,274	5,315	0	36,139	0	0	0	0	8,432
ALL	4,338	22,121	30,513	41,968	44,367	48,385	0	0	25,685

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

Age	<u><1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30+</u>	ALL
All	1,010	5,618	6,560	10,869	1,375	96	0	0	25,530

TABLE 4B
NEW

DULUTH TEACHERS' RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1998

<u>Age</u>	YEARS RETIRED							<u>ALL</u>
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	1	0	0	0	0	0	1
50-54	0	2	0	0	0	0	0	2
55-59	24	16	1	0	0	0	0	41
60-64	24	12	56	0	0	0	0	92
65-69	6	23	90	34	0	0	0	153
70-74	1	4	32	44	0	0	0	81
75-79	1	0	3	17	6	0	0	27
80-84	0	0	1	0	1	0	0	2
85+	0	0	0	0	0	0	0	0
ALL	56	58	183	95	7	0	0	399

AVERAGE ANNUAL BENEFIT

<u>Age</u>	YEARS RETIRED							<u>ALL</u>
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	4,555	0	0	0	0	0	4,555
50-54	0	2,574	0	0	0	0	0	2,574
55-59	29,182	18,406	10,752	0	0	0	0	24,527
60-64	19,568	18,733	14,642	0	0	0	0	16,461
65-69	8,063	9,816	13,587	10,945	0	0	0	12,216
70-74	7,679	17,149	13,531	12,749	0	0	0	13,213
75-79	25,032	0	7,603	7,565	11,267	0	0	9,039
80-84	0	0	6,465	0	15,013	0	0	10,739
85+	0	0	0	0	0	0	0	0
ALL	22,341	14,196	13,748	11,176	11,802	0	0	14,372

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS RETIRED

<u>Age</u>	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	<u>ALL</u>
All	1,251	823	2,515	1,061	82	0	0	5,734

TABLE 5B
NEW

DULUTH TEACHERS' RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1998

Age	YEARS SINCE DEATH							ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	0	0	0	0	0	0	0
50-54	0	0	0	0	0	0	0	0
55-59	0	0	0	0	0	0	0	0
60-64	0	1	4	0	0	0	0	5
65-69	0	0	4	4	0	0	0	8
70-74	0	0	1	5	0	0	0	6
75-79	0	0	1	0	1	0	0	2
80-84	0	0	0	0	0	0	0	0
85+	0	0	0	0	0	0	0	0
ALL	0	1	10	9	1	0	0	21

AVERAGE ANNUAL BENEFIT

Age	YEARS SINCE DEATH							ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	0	0	0	0	0	0	0
50-54	0	0	0	0	0	0	0	0
55-59	0	0	0	0	0	0	0	0
60-64	0	16,878	15,024	0	0	0	0	15,395
65-69	0	0	8,822	11,759	0	0	0	10,291
70-74	0	0	15,763	13,763	0	0	0	14,096
75-79	0	0	1,287	0	13,698	0	0	7,493
80-84	0	0	0	0	0	0	0	0
85+	0	0	0	0	0	0	0	0
ALL	0	16,878	11,243	12,872	13,698	0	0	12,327

TOTAL ANNUAL BENEFIT (ACTUAL DOLLARS) BY YEARS SINCE DEATH

Age	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	ALL
All	0	16,878	112,430	115,848	13,698	0	0	258,867

TABLE 6B
NEW

DULUTH TEACHERS' RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1998

Age	YEARS DISABLED							ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	0	0	0	0	0	0	0
50-54	1	1	2	0	0	0	0	4
55-59	1	0	1	0	0	0	0	2
60-64	1	0	0	0	0	0	0	1
65-69	0	0	1	0	0	0	0	1
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	3	1	4	0	0	0	0	8

AVERAGE ANNUAL BENEFIT

Age	YEARS DISABLED							ALL
	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	
<50	0	0	0	0	0	0	0	0
50-54	1,108	9,189	9,988	0	0	0	0	7,568
55-59	5,510	0	12,146	0	0	0	0	8,828
60-64	2,517	0	0	0	0	0	0	2,517
65-69	0	0	16,681	0	0	0	0	16,681
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	3,045	9,189	12,201	0	0	0	0	8,391

TOTAL ANNUAL BENEFIT (ACTUAL DOLLARS) BY YEARS DISABLED

Age	<u>≤1</u>	<u>1-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	ALL
All	9,135	9,189	48,804	0	0	0	0	67,128

Duluth Teachers' Retirement Fund

Determination Of Contribution Sufficiency

(dollars in thousands)

JULY 1, 1998

	<u>Percent of Payroll</u>	<u>Dollar Amount</u>
A. STATUTORY CONTRIBUTIONS - CHAPTER 353		
1. Employee Contributions	5.50%	\$1,475
2. Employer Contributions	5.79%	1,553
3. Total	<u>11.29%</u>	<u>\$3,028</u>
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	7.06%	\$1,894
b. Disability benefits	0.28%	74
c. Survivors	0.16%	44
d. Deferred Retirement Benefits	0.59%	157
e. Refunds Due to Death or Withdrawal	<u>0.31%</u>	<u>82</u>
f. Total	<u>8.40%</u>	<u>\$2,251</u>

Note: Projected Annual Payroll for Fiscal Year Beginning on JULY 1, 1998 is \$26,819.

Duluth Teachers' Retirement Fund

Summary of Plan Provisions

GENERAL

<i>Eligibility:</i>	A licensed teacher who is employed by the Duluth Public Schools, and eligible licensed staff at Lake Superior College, who have elected to retain their membership in DTRFA. Also includes any employees of the Retirement Fund and certain part-time employees licensed by the State Department of Education. Employees in the New Plan are those first hired on or after July 1, 1981 including any Old Plan Members who may elect to join any time prior to retirement.
<i>Contributions:</i>	
<i>Member:</i>	5.5% of salary.
<i>Employer:</i>	5.79% of salary. (In addition, the State will contribute \$486,000 to the DTRFA plans each year on October 1.)
<i>Allowable Service:</i>	Earned if the Member is employed in a covered position and employee contributions are deducted. May also include certain part-time service, extended leaves of absence, sabbatical leaves, and military service.
<i>Salary:</i>	Total compensation. Excludes any lump-sum annual leave or sick leave payments and lump-sum payment at separation.
<i>Average Salary:</i>	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 Benefit:***

<i>Eligibility:</i>	First hired before July 1, 1989: Age 65 and three 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 higher than age 66 and three years of Allowable Service. Proportionate Retirement Annuity is available at normal retirement age and one year of Allowable Service.
<i>Amount:</i>	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.
	or 1.7% of Average Salary for each year of Allowable Service.
	Hired after June 30, 1989: 1.7% of Average Salary for each year of Allowable Service.

Early Retirement Benefit:

<i>Eligibility:</i>	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.
	Hired after June 30, 1989: Age 55 and three years of Allowable Service.

Amount:

Hired before July 1, 1989:

The greater of 1.2% of Average Salary for 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.

Hired after June 30, 1989:

1.7% of Average Salary for each year of Allowable Service with 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 Social Security retirement age.

Form of Payment: Life annuity. Actuarially equivalent options are:

5, 10, 15 or 20 year certain and life.

50% or 100% joint and survivor with bounce back feature without additional reduction.

A larger life annuity before age 62 and reduced thereafter.

Benefit Increases: Annual Cost-of-Living Adjustment (COLA):

Increase all benefits by 2% each January 1. An additional increase will be allowed when the 5-year average rate of return of the fund exceeds the interest rate assumption of the plan, currently 8.5%. To be eligible for a COLA, a retiree or beneficiary must have received a payment for at least 12 months as of the adjustment date.

DISABILITY

Disability Benefit:

<i>Eligibility:</i>	Totally and permanently disabled under normal retirement age with three years of Allowable Service. Also, at least two of the years of Allowable Service must have been uninterrupted.
<i>Amount:</i>	<p>Normal Retirement Benefit based on Allowable Service and Average Salary at disability without reduction commencement before retirement age. Benefit is reduced by Workers' Compensation.</p> <p>Payments may begin 90 days after disability and stops at normal retirement age, or earlier if disability ceases or death occurs. Benefits paid while partially employed may be reduced.</p>
<i>Form of Payment:</i>	Same as for retirement.
<i>Benefit Increases:</i>	Same as for retirement.

Retirement After Disability:

<i>Eligibility:</i>	Normal retirement age if still totally and permanently disabled.
<i>Amount:</i>	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 actuarial equivalent optional annuity.
<i>Benefit Increase:</i>	Same as for retirement.

DEATH

Surviving Spouse Optional Annuity:

<i>Eligibility:</i>	Member who dies before retirement benefits commence with three years of Allowable Service.
<i>Amount:</i>	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 Member's Contributions:

<i>Eligibility:</i>	Member or former Member dies before receiving any disability or retirement benefits and survivor benefits are not payable.
<i>Amount:</i>	Member's contributions with 5% interest if death occurred before May 16, 1989 or 6% interest if death occurred on or after May 16, 1989.

TERMINATION

Refund of Member's Contributions:

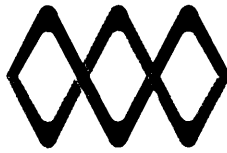
<i>Eligibility:</i>	Termination from teaching service.
<i>Amount:</i>	Member's contributions with 5% interest if termination occurred before May 16, 1989 and 6% interest if termination occurred on or after May 16, 1989. A deferred annuity may be elected in lieu of a refund.

Deferred Annuity:

Eligibility: Three years of Allowable Service.

Amount: Benefit computed under law in effect at termination and increased by the following annual percentage: 3% 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.

R:\CLIENT\06MTD\REPORTS\DLTHCH.DOC



MILLIMAN & ROBERTSON, INC.

Actuaries & Consultants

Internationally WOODROW MILLIMAN

Suite 400, 15800 Bluemound Road, Brookfield, Wisconsin 53005-6069

Telephone: 414/784-2250

Fax: 414/784-7287

November 10, 1998

Mr. Lawrence A. Martin
Executive Director
Minnesota Legislative Commission
on Pensions and Retirement
55 State Office Building
St. Paul, Minnesota 55155-1201

Dear Larry:

Enclosed are two bound and one loose copy of the Duluth Teachers Retirement Fund actuarial valuation as of July 1, 1998. Other copies have been sent in accordance with our contract.

If you have any questions regarding our report, please do not hesitate to call.

Sincerely,

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

TKC/bh

Enclosure

cc: J. Michael Stoffel, Executive Secretary DTRFA (2)
Wayne Simoneau, Commissioner of Finance (2)
Jim Nobles, Legislative Auditor
Legislative Reference Library (2)

N:\CLIENT\06MTD\COR\MARTIN08.DOC