

DULUTH TEACHERS' RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1990

THE *Wyatt* COMPANY

ACTUARIAL SERVICES
PENSION PROGRAMS
ADMINISTRATIVE SYSTEMS
INTERNATIONAL SERVICES
ORGANIZATION SURVEYS

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INSURANCE CONSULTING
HEALTH CARE CONSULTING

November 29, 1990

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

RE: DULUTH TEACHERS' RETIREMENT FUND


Commission Members:


We have prepared an actuarial valuation of the Fund as of July 1, 1990 based on membership and financial data supplied by the Fund.

We certify that to the best of our knowledge and belief this actuarial valuation was performed 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 September 20, 1989.

Respectfully submitted,

THE WYATT COMPANY


Robert E. Perkins, FSA
Consulting Actuary


Michael C. Gunvalson, FSA
Actuary

DULUTH TEACHERS' RETIREMENT FUND

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DULUTH TEACHERS' RETIREMENT FUND

REPORT HIGHLIGHTS (DOLLARS IN THOUSANDS)

	<u>07/01/89</u> <u>VALUATION</u>	<u>07/01/90</u> <u>VALUATION</u>
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 354A % of Payroll	10.29%	10.29%
2. Required Contributions - Chapter 356 % of Payroll	11.16%	10.70%
3. Sufficiency (Deficiency) (A1-A2)	-0.87%	-0.41%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	\$86,539	\$97,187
b. Current Benefit Obligations (Table 8)	\$93,345	\$97,305
c. Funding Ratio (a/b)	92.71%	99.88%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	\$86,539	\$97,187
b. Actuarial Accrued Liability (Table 9)	\$99,899	\$103,824
c. Funding Ratio (a/b)	86.63%	93.61%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	\$133,157	\$137,446
b. Current and Expected Future Benefit Obligations	\$141,348	\$141,112
c. Funding Ratio (a/b)	94.21%	97.40%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	1,620	1,553
b. Projected Annual Earnings	\$41,314	\$40,548
c. Average Annual Earnings (Actual \$)	\$25,503	\$26,109
d. Average Age	42.8	43.2
e. Average Service	9.4	10.2
2. Others		
a. Service Retirements (Table 4)	627	634
b. Disability Retirements (Table 5)	13	11
c. Survivors (Table 6)	28	29
d. Deferred Retirements (Table 7)	43	42
e. Terminated Other Non-vested (Table 7)	304	435
f. Total	1,015	1,151

DULUTH TEACHERS' RETIREMENT FUND

COMMENTARY

Purpose

The purpose of this valuation is to determine the financial status of the Fund. 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 statutory contributions for the Duluth Teachers' Retirement Fund are deficient for 1990 by an amount of .41% of payroll. According to this valuation a contribution rate of 10.70% is required to comply with Minnesota Law. This contribution rate is based on a new retirement age assumption adopted for the July 1, 1990 valuation. All plan provisions and all other actuarial assumptions are the same as in the prior valuation.

The financial status of the Fund 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 progress. This year's ratio is 99.88%. The corresponding ratio for the prior year was 92.71%.

- 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. For 1990 the ratio is 93.61%, which is

an increase from the 1989 value of 86.63%.

- o The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This ratio which is less than 100%, verifies 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 gains 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.

The term MPRIIF appears on some of the tables with a corresponding value of zero. MPRIIF stands for Minnesota Post Retirement Investment Fund, which is used by many of the public funds. For purposes of consistency all of the actuarial reports follow the same format.

Membership Data (Tables 3, 4, 5, 6 and 7)

Tables 3 through 6 summarize statistical information on members by category. Active members are grouped by age and completed years of service in Table 3. The earnings shown for these members are for the prior fiscal year except in the case of fulltime new hires where earnings have been annualized.

The service retirements are shown in Table 4 and disabled members are shown in Table 5. The annuities that are shown in Table 4 do not include the temporary higher benefit that is payable prior to the commencement of Social Security benefits under the level income option. The survivors category (Table 6) includes spouses and children of deceased members.

The reconciliation of active members in Table 7 provides a method for tracking what happened to members during the past year.

Actuarial Balance Sheet (Table 8)

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

Current funding levels are evaluated by comparing Current Assets on line A to Current Benefit Obligations on line D5. Current and future funding levels are evaluated by comparing the Total Current and Expected Future Assets on line C to the Total Current and Expected Future Benefit Obligations on line F.

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, 1990 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table. This table shows the impact of the change in actuarial assumptions. See page 8 for an explanation of the change in actuarial assumptions.

	<u>Old Assumptions</u>	<u>New Assumptions</u>
Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	\$34,447,000	\$34,447,000
Current Employees -		
Accumulated employee contributions including allocated investment income	23,587,000 *	23,587,000 *
Employer-financed vested	31,492,000	32,394,000
Employer-financed nonvested	7,163,000	6,877,000
	-----	-----
Total Pension Benefit Obligation	\$96,689,000	\$97,305,000

* Estimated

The net assets available for benefits at cost is \$94,480,000. The total Pension Benefit Obligation exceeds the assets by \$2,825,000 to produce a funded ratio of 97.10%.

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. The major sources of gain and loss, which have been identified, are:

- o A gain from salaries where the average increase was 2.4% compared to the expected 6.5%.
- o A gain from Current Assets because the return was 14.1% instead of the assumed 8.5%.

Contribution Sufficiency (Table 11)

This report answers the question of "How adequate are the 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 Fund has a contribution deficiency since the Statutory Contribution Rate is 10.29% compared to the Required Contribution Rate of 10.70%.

Projected Cash Flow (Table 12)

Table 12 illustrates the anticipated cash flow over the amortization period. The cash flow begins with the Current Assets. Contributions are then added based on the present statutory rates for employers and employees. As members become eligible for payments, disbursements and expenses are made from the Fund.

This projected cash flow assumes that future payrolls increase by 6.5%. This is the only table in the report where new members are assumed to be hired in order to replace those who terminate from the active group. This open group method provides a more realistic picture of future cash flow. The statutory interest rate of 8.5% is used to project future investment return. The assumed bonus payment of 1% has been taken out of year-end assets and added to the disbursements in the following year.

Changes in Plan Provisions

This valuation does not reflect any changes in plan provisions since the prior valuation.

Changes in Actuarial Assumptions

The retirement age assumption was changed from age 63 to age 61 for the Old Plan and from age 63 and 30 years of service to age 63 only for the New Plan.

	<u>Impact Due To Changes In Actuarial Assumptions</u>
Actuarial Accrued Liability	\$647,000
Pension Benefit Obligation for GASB No. 5	616,000
Normal Cost	(.03%)
Supplemental Contribution	<u>.07%</u>
Required Contribution	.04%

Old and New

Additional tables at the end of this report show membership data, statutory contributions and normal costs for the Old and New Plans.

TABLE 1

DULUTH TEACHERS' RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1990

	<u>MARKET VALUE</u>	<u>COST VALUE</u>
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	\$23,603	\$23,603
2. Investments		
a. Fixed Income	42,439	38,057
b. Equity	35,059	31,321
c. Real Estate	51	51
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	0	0
4. Other	1,608	1,608
B. TOTAL ASSETS	<u>\$102,760</u>	<u>\$94,640</u>
C. AMOUNTS CURRENTLY PAYABLE	\$160	\$160
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	\$15,383	\$15,383
2. Employer Reserves	87,217	79,097
3. MPRIF Reserves	0	0
4. Non-MPRIF Reserves	0	0
5. Total Assets Available for Benefits	<u>\$102,600</u>	<u>\$94,480</u>
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	<u>\$102,760</u>	<u>\$94,640</u>
<hr/>		
F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS		
1. Cost Value of Assets Available for Benefits (D5)		\$94,480
2. Market Value (D5)	\$102,600	
3. Cost Value (D5)	94,480	
4. Market Over Cost (F2-F3)	<u>\$8,120</u>	
5. 1/3 of Market Over Cost(F4)/3		2,707
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		<u>\$97,187</u>

TABLE 2

DULUTH TEACHERS' RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS AND ASSET ALLOCATION
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1990

	<u>MARKET VALUE</u>	<u>COST VALUE</u>
A. ASSETS AVAILABLE AT BEGINNING OF YEAR	\$93,941	\$82,838
B. OPERATING REVENUES		
1. Member Contributions	\$1,826	\$1,826
2. Employer Contributions	2,222	2,222
3. Investment Income	6,560	6,560
4. MPRIF Income	0	0
5. Net Realized Gain (Loss)	6,533	6,533
6. Other	30	30
7. Net Change in Unrealized Gain (Loss)	(2,983)	0
	-----	-----
8. Total Revenue	\$14,188	\$17,171
	-----	-----
C. OPERATING EXPENSES		
1. Service Retirements	\$4,629	\$4,629
2. Disability Benefits	91	91
3. Survivor Benefits	153	153
4. Refunds	141	141
5. Expenses	515	515
6. Other	0	0
	-----	-----
7. Total Disbursements	\$5,529	\$5,529
	-----	-----
D. CHANGES IN ACCOUNTING METHOD	0	0
E. ASSETS AVAILABLE AT END OF YEAR	\$102,600	\$94,480
	=====	=====

TABLE 3

DULUTH TEACHERS' RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1990

AGE	YEARS OF SERVICE								TOTAL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	36	2							38
25-29	53	47	9						109
30-34	34	81	23	1					139
35-39	53	88	53	49	18				261
40-44	93	85	48	39	76	19			360
45-49	20	30	25	41	45	80	18		259
50-54	10	17	17	23	28	52	40	6	193
55-59	7	9	5	8	22	31	36	19	137
60-64	5	3	2	10	8	12	3	6	49
65+	4			1			3		8
TOTAL	315	362	182	172	197	194	100	31	1,553

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE								ALL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	1,218	11,020							1,734
25-29	2,101	15,764	21,720						9,612
30-34	1,532	17,528	22,496	23,744					14,482
35-39	1,409	20,252	24,501	30,919	36,745				20,429
40-44	4,831	20,780	27,430	34,311	38,771	35,757			23,601
45-49	1,473	21,862	30,576	35,259	37,070	38,644	37,136		32,137
50-54	430	16,138	29,911	32,935	38,612	37,536	40,309	39,574	33,303
55-59	920	11,414	24,598	35,890	40,102	37,724	38,641	40,707	34,565
60-64	800	19,720	25,341	30,879	31,065	38,522	36,739	41,272	30,434
65+	868			30,598			35,564		17,595
ALL	2,473	18,849	26,234	33,178	38,010	37,910	38,888	40,597	24,516

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

<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
779	6,823	4,775	5,707	7,487	7,354	3,889	1,259	38,073

TABLE 4

DULUTH TEACHERS' RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1990

AGE	YEARS RETIRED							TOTAL
	<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
50-54								0
55-59	14	36						50
60-64	12	80	46					138
65-69	5	27	73	14				119
70-74		1	47	41	3			92
75-79			1	52	27	1		81
80-84				2	58	16	1	77
85+					8	38	31	77
TOTAL	31	144	167	109	96	55	32	634

AVERAGE ANNUAL ANNUITY

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
50-54								0
55-59	5,912	5,580						5,673
60-64	6,969	7,929	5,031					6,880
65-69	9,741	5,651	5,921	2,410				5,607
70-74		112	5,175	3,634	2,916			4,360
75-79			4,499	3,614	3,709	3,425		3,654
80-84				4,426	4,492	2,979	1,723	4,140
85+					4,841	3,592	3,090	3,520
ALL	6,939	6,860	5,457	3,482	4,251	3,411	3,048	5,027

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

<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>TOTAL</u>
215	988	911	379	408	188	98	3,187

TABLE 5

DULUTH TEACHERS' RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1990

AGE	YEARS DISABLED							TOTAL
	<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		2						2
50-54		1						1
55-59		2		1				3
60-64		1	1	1				3
65-69			2					2
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	0	6	3	2	0	0	0	11

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		4,089						4,089
50-54		12,743						12,743
55-59		12,778		2,724				9,427
60-64		4,064	5,374	2,381				3,940
65-69			5,119					5,119
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	0	8,424	5,204	2,553	0	0	0	6,478

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY

<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>TOTAL</u>
0	50	16	5	0	0	0	71

TABLE 6

DULUTH TEACHERS' RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1990

AGE	YEARS SINCE DEATH							TOTAL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								0
50-54								0
55-59		1						1
60-64		1	1					2
65-69		1	4	1	1	1		8
70-74			1	3	2	2		8
75-79					2			2
80-84					4	1		5
85+						1	2	3
TOTAL	0	3	6	4	9	5	2	29

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								0
50-54								0
55-59		6,450						6,450
60-64		2,033	5,920					3,977
65-69		12,410	5,694	533	2,346	902		4,871
70-74			2,343	3,113	845	1,901		2,147
75-79					2,458			2,458
80-84					3,293	2,389		3,112
85+						1,909	1,501	1,637
ALL	0	6,964	5,173	2,468	2,458	1,800	1,501	3,308

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH							
<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	21	31	10	22	9	3	96

DULUTH TEACHERS' RETIREMENT FUND
RECONCILIATION OF MEMBERS

TABLE 7

	<u>ACTIVES</u>	<u>TERMINATED</u>	
		<u>DEFERRED RETIREMENT</u>	<u>OTHER NON-VESTED</u>
A. On June 30, 1989	1,620	43	304
B. Additions	190	12	163
C. Deletions:			
1. Service Retirement	(19)	(1)	(3)
2. Disability	0	0	0
3. Death	(1)	(1)	0
4. Terminated-Deferred	(9)	-	0
5. Terminated-Refund	(42)	0	(19)
6. Terminated-Other Non-vested	(155)	0	-
7. Returned as Active	-	0	0
D. Data Adjustments	(31)	(11)	(10)
	Vested	1,056	
	Non-Vested	497	
E. Total on June 30, 1990	1,553	42	435

	<u>RECIPIENTS</u>		
	<u>RETIREMENT ANNUITANTS</u>	<u>DISABLED</u>	<u>SURVIVORS</u>
A. On June 30, 1989	627	13	28
B. Additions	23	0	2
C. Deletions:			
1. Service Retirement	-	0	-
2. Death	(26)	(2)	(1)
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	-
D. Data Adjustments	10	0	0
E. Total on June 30, 1990	634	11	29

TABLE 8

DULUTH TEACHERS' RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1990

A. CURRENT ASSETS (TABLE 1, F6)				\$97,187
B. EXPECTED FUTURE ASSETS				
1. Present Value of Expected Future Statutory Supplemental Contributions				2,971
2. Present Value of Future Normal Costs				37,288
3. Total Expected Future Assets				40,259
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS				\$137,446
D. CURRENT BENEFIT OBLIGATIONS	<u>Non-Vested</u>	<u>Vested</u>	<u>Total</u>	
1. Benefit Recipients				
a. Retirement Annuities		\$31,813	\$31,813	
b. Disability Benefits		968	968	
c. Surviving Spouse and Child Benefits		843	843	
2. Deferred Retirements		559	559	
3. Former Members without Vested Rights		264	264	
4. Active Members				
a. Retirement Annuities	339	51,975	52,314	
b. Disability Benefits	5,195	0	5,195	
c. Survivors' Benefits	1,272	0	1,272	
d. Deferred Retirements	71	3,628	3,699	
e. Refund Liability Due to Death or Withdrawal	0	378	378	
5. Total Current Benefit Obligations	\$6,877	\$90,428	\$97,305	
E. EXPECTED FUTURE BENEFIT OBLIGATIONS				\$43,807
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS				\$141,112
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)				\$118
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)				\$3,666

TABLE 9

DULUTH TEACHERS' RETIREMENT FUND

**DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
AND SUPPLEMENTAL CONTRIBUTION RATE
(DOLLARS IN THOUSANDS)**

JULY 1, 1990

	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	\$89,766	\$26,932	\$62,834
b. Disability Benefits	8,765	4,164	4,601
c. Survivors Benefits	2,003	717	1,286
d. Deferred Retirements	5,451	4,456	995
e. Refunds Due to Death or Withdrawal	680	1,019	(339)
f. Total	<u>\$106,665</u>	<u>\$37,288</u>	<u>\$69,377</u>
2. Deferred Retirements	\$559		\$559
3. Former Members Without Vested Rights	264		264
4. Annuitants in MPRIF	0		0
5. Recipients Not in MPRIF	33,624		33,624
6. Total	<u>\$141,112</u>	<u>\$37,288</u>	<u>\$103,824</u>
B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)			
1. AAL (A6)			\$103,824
2. Current Assets (Table 1,F6)			97,187
3. UAAL (B1-B2)			<u>\$6,637</u>
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE			
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2020			\$900,261
2. Supplemental Contribution Rate (B3/C1)			0.74%

TABLE 10

DULUTH TEACHERS' RETIREMENT FUND
CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1990

A. UAAL AT BEGINNING OF YEAR	\$13,360
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	\$3,952
2. Contribution	(4,048)
3. Interest on A, B1, and B2	1,132
4. Total (B1+B2+B3)	\$1,036
C. EXPECTED UAAL AT END OF YEAR (A+B4)	\$14,396
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	(\$3,420)
2. Investment Return	(4,805)
3. MPRIF Mortality	0
4. Mortality of Other Benefit Recipients	(1,042)
5. Other Items	861
6. Total	(\$8,406)
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	\$5,990
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	\$0
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	\$647
H. UAAL AT END OF YEAR (E+F+G)	\$6,637

TABLE 11

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

JULY 1, 1990

	<u>% OF PAYROLL</u>	<u>\$ AMOUNT</u>
A. STATUTORY CONTRIBUTIONS - CHAPTER 354A		
1. Employee Contributions	4.50%	\$1,825
2. Employer Contributions	5.79%	2,348
3. Total	----- 10.29% =====	----- \$4,173 =====
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	6.35%	\$2,575
b. Disability Benefits	0.92%	375
c. Survivors	0.18%	72
d. Deferred Retirement Benefits	1.02%	414
e. Refunds Due to Death or Withdrawal	0.22%	88
f. Total	----- 8.69% -----	----- \$3,524 -----
2. Supplemental Contribution Amortization by July 1, 2020 of UAAL of \$6,637	0.74%	\$300
3. Allowance for Expenses	1.27%	\$515
4. Total	----- 10.70%	----- \$4,339
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)		
	-0.41%	(\$166)

Note: Projected Annual Payroll for Fiscal Year Beginning
on July 1, 1990 is \$40,548

DULUTH TEACHERS' RETIREMENT FUND

TABLE 12

PROJECTED CASH FLOW JULY 1, 1990

<u>FISCAL YEAR</u>	<u>STATUTORY CONTRIBUTIONS</u>	<u>TRANSFERS</u>	<u>OTHER DISBURSEMENTS</u>	<u>INVESTMENT RETURN</u>	<u>CURRENT ASSETS YEAR END</u>
1990					\$97,187
1991	\$4,173	\$0	\$5,500	\$8,204	104,064
1992	4,444	0	5,976	8,780	111,312
1993	4,732	0	6,191	9,400	119,253
1994	5,040	0	6,616	10,070	127,747
1995	5,368	0	7,178	10,782	136,719
1996	5,717	0	7,746	11,535	146,225
1997	6,088	0	8,422	12,330	156,221
1998	6,484	0	9,063	13,169	166,811
1999	6,905	0	9,871	14,053	177,898
2000	7,354	0	10,774	14,976	189,454
2001	7,832	0	11,844	15,933	201,375
2002	8,341	0	12,932	16,922	213,706
2003	8,883	0	14,146	17,941	226,384
2004	9,461	0	15,339	18,993	239,499
2005	10,076	0	16,914	20,067	252,728
2006	10,731	0	18,301	21,160	266,318
2007	11,428	0	19,674	22,287	280,359
2008	12,171	0	20,917	23,459	295,072
2009	12,962	0	22,417	24,679	310,296
2010	13,805	0	23,792	25,951	326,260
2011	14,702	0	25,035	27,293	343,220
2012	15,658	0	26,123	28,729	361,484
2013	16,675	0	27,632	30,260	380,787
2014	17,759	0	29,570	31,865	400,841
2015	18,914	0	31,205	33,549	422,099
2016	20,143	0	32,576	35,350	445,016
2017	21,452	0	33,860	37,299	469,907
2018	22,847	0	35,651	39,398	496,501
2019	24,332	0	37,297	41,652	525,188
2020	25,913	0	38,971	44,086	556,216

DULUTH TEACHERS' RETIREMENT FUND
SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: 8.5% per annum Post-Retirement: 8.5% per annum
Salary Increases:	Reported salary increased 6.5% to current fiscal year and 6.5% annually for each future year.
Mortality:	Pre-Retirement: Male - 1971 Group Annuity Mortality Table male rates set back 8 years Female - 1971 Group Annuity Mortality Table male rates set back 8 years Post-Retirement: Male - Same as above Female - Same as above Post-Disability: Male - Same as above Female - Same as above
Retirement Age:	Effective July 1, 1990, age 61 for the Old Plan and age 63 for the New Plan. Prior to July 1, 1990, age 63 for the Old Plan and age 63 with 30 years of service or age 65 for the New Plan. In addition, 30% of the members are assumed to retire each year that they are eligible for the Rule of 90.
Separation:	Graded rates shown in rate table.
Disability:	Rates as shown in rate table.
Expenses:	Prior year expenses expressed as percentage of prior year payroll. (1.27% of 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:	80% of Members are assumed to be married. Female is three years younger than male.
Social Security:	NA
Benefit Increases After Retirement:	NA

TABLE 13
(cont)

Special Consideration:	<p>Annual bonus payment totaling 1% of the year end assets is accounted for by using a 7.5% post and pre-retirement interest rate.</p> <p>Members in the Old Plan are assumed to receive their retirement benefits from the New Plan. Members who terminated under 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> <p>Male - 40% elect 50% J & S option; - 40% elect 100% J & S option;</p> <p>Female - 10% elect 50% J & S option; 10% elect 100% J & S option.</p>
Actuarial Cost Method:	<p>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.</p>
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.
Projected Cash Flow Method:	Cash flows from the Fund were projected based on the current plan benefits, participant data, and actuarial assumptions. In addition, new entrants were assumed so that the total payroll would increase by 6.5% per annum.

TABLE 13
(cont)

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	2,000	2,000	28	28	0	0
21	4	4	1,931	1,931	28	28	0	0
22	4	4	1,731	1,731	28	28	0	0
23	4	4	1,532	1,532	28	28	0	0
24	4	4	1,332	1,332	28	28	0	0
25	5	5	1,132	1,132	28	28	0	0
26	5	5	932	932	28	28	0	0
27	5	5	732	732	28	28	0	0
28	5	5	703	703	28	28	0	0
29	5	5	673	673	28	28	0	0
30	5	5	643	643	28	28	0	0
31	6	6	612	612	28	28	0	0
32	6	6	582	582	28	28	0	0
33	6	6	552	552	28	28	0	0
34	7	7	522	522	28	28	0	0
35	7	7	491	491	29	29	0	0
36	7	7	461	461	29	29	0	0
37	8	8	430	430	30	30	0	0
38	8	8	409	409	31	31	0	0
39	9	9	389	389	31	31	0	0
40	9	9	368	368	32	32	0	0
41	10	10	347	347	33	33	0	0
42	10	10	325	325	35	35	0	0
43	11	11	304	304	37	37	0	0
44	12	12	282	282	38	38	0	0
45	13	13	260	260	41	41	0	0
46	14	14	237	237	43	43	0	0
47	15	15	214	214	46	46	0	0
48	16	16	191	191	49	49	0	0
49	18	18	167	167	53	53	0	0
50	20	20	143	143	57	57	0	0
51	23	23	118	118	62	62	0	0
52	26	26	92	92	68	68	0	0
53	29	29	67	67	74	74	0	0
54	33	33	40	40	80	80	0	0

TABLE 13
(cont)

Age	Death		Withdrawal		Disability		Retirement	
	Male	Female	Male	Female	Male	Female	Male	Female
55	38	38	13	13	87	87	0	0
56	42	42	0	0	95	95	0	0
57	47	47	0	0	104	104	0	0
58	53	53	0	0	114	114	0	0
59	59	59	0	0	125	125	0	0
60	65	65	0	0	136	136	0	0
61	71	71	0	0	149	149	0	0
62	78	78	0	0	163	163	0	0
63	85	85	0	0	0	0	10,000	10,000
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

DULUTH TEACHERS' RETIREMENT FUND

TABLE 3A
OLD

ACTIVE MEMBERS AS OF JUNE 30, 1990

AGE	YEARS OF SERVICE								TOTAL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25									0
25-29									0
30-34			5	1					6
35-39		2	9	49	18				78
40-44			10	39	76	19			144
45-49			5	40	45	80	18		188
50-54			5	21	28	52	40	6	152
55-59			2	8	22	31	36	19	118
60-64		1		10	8	12	3	6	40
65+				1			3		4
TOTAL	0	3	36	169	197	194	100	31	730

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE								ALL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25									0
25-29									0
30-34			24,913	23,744					24,718
35-39		13,209	25,158	30,919	36,745				31,145
40-44			28,122	34,311	38,771	35,757			36,426
45-49			24,353	35,017	37,070	38,644	37,136		36,971
50-54			33,357	33,065	38,612	37,536	40,309	39,574	37,789
55-59			21,544	35,890	40,102	37,724	38,641	40,707	38,529
60-64		27,161		30,879	31,065	38,522	36,739	41,272	35,115
65+				30,598			35,564		34,323
ALL	0	17,859	26,774	33,127	38,010	37,910	38,888	40,597	36,446

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

<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
0	54	964	5,598	7,488	7,354	3,889	1,259	26,606

DULUTH TEACHERS' RETIREMENT FUND

TABLE 4A
OLD

SERVICE RETIREMENTS AS OF JUNE 30, 1990

AGE	YEARS RETIRED							TOTAL
	<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
50-54								0
55-59	8	15						23
60-64	2	35	27					64
65-69	1	10	52	14				77
70-74		1	39	41	3			84
75-79			1	52	27	1		81
80-84				2	58	16	1	77
85+					8	38	31	77
TOTAL	11	61	119	109	96	55	32	483

AVERAGE ANNUAL ANNUITY

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
50-54								0
55-59	4,778	3,443						3,907
60-64	5,650	6,370	2,728					4,811
65-69	866	6,452	4,906	2,410				4,600
70-74		112	4,668	3,634	2,916			4,046
75-79			4,499	3,614	3,709	3,425		3,654
80-84				4,426	4,492	2,979	1,723	4,140
85+					4,841	3,592	3,090	3,520
ALL	4,580	5,561	4,330	3,482	4,251	3,411	3,048	4,094

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

<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>TOTAL</u>
50	339	516	379	408	188	98	1,978

DULUTH TEACHERS' RETIREMENT FUND

TABLE 5A
OLD

DISABILITY RETIREMENTS AS OF JUNE 30, 1990

AGE	YEARS DISABLED							TOTAL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50		2						2
50-54								0
55-59		1		1				2
60-64		1	1	1				3
65-69			2					2
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	0	4	3	2	0	0	0	9

AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50		4,089						4,089
50-54								0
55-59		7,740		2,724				5,232
60-64		4,064	5,374	2,381				3,940
65-69			5,119					5,119
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	0	4,996	5,204	2,553	0	0	0	4,522

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY							
<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	20	16	5	0	0	0	41

DULUTH TEACHERS' RETIREMENT FUND

TABLE 6A
OLD

SURVIVORS AS OF JUNE 30, 1990

AGE	YEARS SINCE DEATH							TOTAL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								0
50-54								0
55-59								0
60-64		1	1					2
65-69			2	1	1	1		5
70-74			1	3	2	2		8
75-79					2			2
80-84					4	1		5
85+						1	2	3
TOTAL	0	1	4	4	9	5	2	25

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								0
50-54								0
55-59								0
60-64		2,033	5,920					3,977
65-69			5,542	533	2,346	902		2,973
70-74			2,343	3,113	845	1,901		2,147
75-79					2,458			2,458
80-84					3,293	2,389		3,112
85+						1,909	1,501	1,637
ALL	0	2,033	4,837	2,468	2,458	1,800	1,501	2,615

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH							
<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	2	19	10	22	9	3	65

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

TABLE 11A
OLD

JULY 1, 1990

	<u>% OF PAYROLL</u>	<u>\$ AMOUNT</u>
A. STATUTORY CONTRIBUTIONS - CHAPTER 354A		
1. Employee Contributions	4.50%	\$1,275
2. Employer Contributions	5.79%	1,641
3. Total	----- 10.29% =====	----- \$2,916 =====
B. REQUIRED CONTRIBUTIONS - CHAPTER 356 (NORMAL COST ONLY)		
1. Normal Cost		
a. Retirement Benefits	6.03%	\$1,708
b. Disability Benefits	0.84%	239
c. Survivors	0.20%	56
d. Deferred Retirement Benefits	1.18%	333
e. Refunds Due to Death or Withdrawal	0.20%	58
f. Total	----- 8.45% -----	----- \$2,394 -----

Note: Projected Annual Payroll for Fiscal Year Beginning
on July 1, 1990 is \$28,335

DULUTH TEACHERS' RETIREMENT FUND

SUMMARY OF PLAN PROVISIONS

Eligibility	A teacher who is employed by the Board of Education of the City of Duluth. Also includes any employees of the Retirement Fund and certain part-time employees licensed by the state Board of Education. Employees in the Old Plan are those hired before July 1, 1981 who have not elected to join the New Plan.
Contributions	
Member	4.5% of Salary.
Employer	5.79% of Salary.
Credited Service	Earned while employed by the school district in a position with respect to which regular contributions are made. Credit is granted for service less than a legal school year on a pro rata basis.
Salary	Annual contract salary.
Average Salary	Average of the 5 highest years of annual salary.
RETIREMENT	
Normal Retirement Benefit	
Eligibility	Age 60 and 1 year of Credited Service.
Amount	The greater of 1.25% of Average Salary for each year of Credited Service. or 1.5% of Average Salary for each year of Credited Service assuming augmentation to age 65 at 3% per year and actuarial reduction for each month Member is under age 65. Minimum benefit for employees who were Members on June 30, 1971 is equal to the actuarial equivalent of 2.4 times the accumulated regular contributions.
Early Retirement Benefit	
Eligibility	Age 55 and 5 years of Credited Service. Rule of 90: Age plus Credited Service totals 90.

TABLE 14A
OLD
(cont)

Amount	<p>The greater of</p> <p>1.25% 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.</p> <p>or</p> <p>1.5% of Average Salary for each year of Credited Service assuming augmentation to age 65 at 3% per year and actuarial reduction for each month the Member is under age 65.</p>
Form of Payment	<p>Life annuity.</p> <p>Actuarially equivalent options are:</p> <p>5, 10, 15 or 20 year certain and life</p> <p>50% or 100% joint and survivor with bounce back feature without additional reduction (option is cancelled if Member is pre-deceased by beneficiary)</p> <p>Other equivalent options approved by the Board.</p>
Benefit Increases	<p>If the investment income of the fund was at least 6% of the asset value of the fund at the end of the year, the Board of Trustees may declare a bonus of up to 1% of the asset value of the fund at the end of the previous fiscal year. This bonus is allocated to those eligible on a prorated basis according to the combined number of years of service and years receiving a benefit. A retired Member is eligible if receiving an annuity for at least 3 years.</p> <p>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 preceding 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.</p>
DISABILITY Disability Benefit Eligibility	<p>Totally and permanently disabled before the age of 60 with 5 years of Credited Service.</p>

TABLE 14A
OLD
(cont)

Amount	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.
Form of Payment	Same as for retirement.
Benefit Increases	Same as for retirement.
DEATH	
Return of Contributions I Eligibility	Death while active.
Amount	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 Eligibility	Death of Member who terminated employment after 10 years of service.
Amount	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 Eligibility	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.
Amount	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 in excess of benefits paid.
Surviving Spouse Optional Annuity I Eligibility	Death of active Member with 10 years of Credited Service.
Amount	In lieu of Return of Contributions I, an annuity to surviving spouse equivalent to 120% of the value of what would have been refunded.

**TABLE 14A
OLD
(cont)**

Surviving Spouse
Optional Annuity II
Eligibility

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.

Amount

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
Eligibility

Termination from teaching service.

Amount

Member's contributions with 5% interest compounded annually if termination occurred before May 16, 1989, or 6% interest compounded annually 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

10 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.

DULUTH TEACHERS' RETIREMENT FUND

TABLE 3B
NEW

ACTIVE MEMBERS AS OF JUNE 30, 1990

AGE	YEARS OF SERVICE								TOTAL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	36	2							38
25-29	53	47	9						109
30-34	34	81	18						133
35-39	53	86	44						183
40-44	93	85	38						216
45-49	20	30	20	1					71
50-54	10	17	12	2					41
55-59	7	9	3						19
60-64	5	2	2						9
65+	4								4
TOTAL	315	359	146	3	0	0	0	0	823

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE								ALL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	1,218	11,020							1,734
25-29	2,101	15,764	21,720						9,612
30-34	1,532	17,528	21,824						14,020
35-39	1,409	20,416	24,367						15,861
40-44	4,831	20,780	27,247						15,051
45-49	1,473	21,862	32,132	44,947					19,337
50-54	430	16,138	28,476	31,564					16,670
55-59	920	11,414	26,634						9,951
60-64	800	16,000	25,341						9,631
65+	868								868
ALL	2,473	18,857	26,101	36,025	0	0	0	0	13,934

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

<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
779	6,769	3,811	108	0	0	0	0	11,467

DULUTH TEACHERS' RETIREMENT FUND

TABLE 4B
NEW

SERVICE RETIREMENTS AS OF JUNE 30, 1990

AGE	YEARS RETIRED							TOTAL
	<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
50-54								0
55-59	6	21						27
60-64	10	45	19					74
65-69	4	17	21					42
70-74			8					8
75-79								0
80-84								0
85+								0
TOTAL	20	83	48	0	0	0	0	151

AVERAGE ANNUAL ANNUITY

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
50-54								0
55-59	7,425	7,106						7,177
60-64	7,233	9,142	8,304					8,669
65-69	11,960	5,179	8,434					7,452
70-74			7,651					7,651
75-79								0
80-84								0
85+								0
ALL	8,236	7,815	8,252	0	0	0	0	8,010

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

<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>TOTAL</u>
165	648	396	0	0	0	0	1,209

DULUTH TEACHERS' RETIREMENT FUND

TABLE 5B
NEW

DISABILITY RETIREMENTS AS OF JUNE 30, 1990

AGE	YEARS DISABLED							TOTAL
	<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
50-54		1						1
55-59		1						1
60-64								0
65-69								0
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	0	2	0	0	0	0	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
50-54		12,743						12,743
55-59		17,816						17,816
60-64								0
65-69								0
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	0	15,280	0	0	0	0	0	15,280

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY

<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>	TOTAL
0	31	0	0	0	0	0	31

DULUTH TEACHERS' RETIREMENT FUND

TABLE 6B
NEW

SURVIVORS AS OF JUNE 30, 1990

AGE	YEARS SINCE DEATH							TOTAL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								0
50-54								0
55-59		1						1
60-64								0
65-69		1	2					3
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	0	2	2	0	0	0	0	4

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								0
50-54								0
55-59		6,450						6,450
60-64								0
65-69		12,410	5,847					8,034
70-74								0
75-79								0
80-84								0
85+								0
ALL	0	9,430	5,847	0	0	0	0	7,638

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

	<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
	0	19	12	0	0	0	0	31

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

TABLE 11B
NEW

JULY 1, 1990

	<u>% OF PAYROLL</u>	<u>\$ AMOUNT</u>
A. STATUTORY CONTRIBUTIONS - CHAPTER 354A		
1. Employee Contributions	4.50%	\$550
2. Employer Contributions	5.79%	707
	-----	-----
3. Total	10.29%	\$1,257
	=====	=====
B. REQUIRED CONTRIBUTIONS - CHAPTER 356 (NORMAL COST ONLY)		
1. Normal Cost		
a. Retirement Benefits	7.10%	\$867
b. Disability Benefits	1.11%	136
c. Survivors	0.13%	16
d. Deferred Retirement Benefits	0.66%	81
e. Refunds Due to Death or Withdrawal	0.25%	30
	-----	-----
f. Total	9.25%	\$1,130
	-----	-----

Note: Projected Annual Payroll for Fiscal Year Beginning
on July 1, 1990 is \$12,213

DULUTH TEACHERS' RETIREMENT FUND

SUMMARY OF PLAN PROVISIONS

Eligibility	A teacher who is employed by the Board of Education of the City of Duluth. Also includes any employees of the Retirement Fund and certain part-time employees licensed by the state Board of Education. Employees in the New Plan are those who joined on or after July 1, 1981 including any Old Plan Members who may elect to join any time prior to retirement.
Contributions	
Member	4.50% of Salary.
Employer	5.79% of Salary.
Allowable Service	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.
Salary	Total compensation. Excludes any lump sum annual leave or sick leave payments and lump sum payments at separation.
Average Salary	Average of the 5 highest successive years of Salary. Average Salary is based on all Allowable Service if less than 5 years.

RETIREMENT

Normal Retirement Benefit

Eligibility

First hired before July 1, 1989:
 Age 65 and 3 years of Allowable Service.
 Proportionate Retirement Annuity is available at age 65 and 1 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 and 3 years of Allowable Service.
 Proportionate Retirement Annuity is available at normal retirement age and 1 year of Allowable Service.

Amount

1.5% of Average Salary for each year of Allowable Service.

TABLE 14B
NEW
(cont)

Early Retirement Benefit Eligibility	Age 55 and 3 years of Allowable Service. Any age with 30 years of Allowable Service. Rule of 90: Age plus Allowable Service totals 90.
Amount	<p>Hired before July 1, 1989:</p> <p>The greater of</p> <p>1% of Average Salary for 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.</p> <p>or</p> <p>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.</p> <p>Hired after June 30, 1989:</p> <p>1.5% 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.</p>
Form of Payment	<p>Life annuity.</p> <p>Actuarially equivalent options are:</p> <p>5, 10, 15 or 20 year certain and life</p> <p>50% or 100% joint and survivor with bounce back feature without additional reduction (option is cancelled if Member is pre-deceased by beneficiary).</p> <p>Guaranteed refund</p> <p>A larger life annuity before age 62 and reduced thereafter.</p>
Benefit Increases	<p>If the investment income of the fund was at least 6% of the asset value of the fund at the end of the year, the Board of Trustees may declare a bonus of up to 1% of the asset value of the fund at the end of the previous fiscal year. This bonus is allocated to those eligible on a prorated basis according to the combined number of years of service and years receiving a benefit. A retired Member is eligible if receiving an annuity for at least 3 years.</p>

TABLE 14B
NEW
(cont)

Members retired under law in effect before June 30, 1971 receive an additional lump sum payment each year. In 1989, this lump sum payment is \$25 times each full year of Credited Service. In each following year, the lump sum payment will increase by the same percentage increase that is applied to regular annuities.

DISABILITY

**Disability Benefit
Eligibility**

Totally and permanently disabled under normal retirement age and is age 50 or older with 3 years of Allowable Service. Also, at least 2 of the years of Allowable Service must have been uninterrupted.

Amount

Normal Retirement Benefit based on Allowable Service and Average Salary at disability without reduction for commencement before normal retirement age. Benefit is reduced by Workers' Compensation.

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.

Form of Payment

Same as for retirement.

Benefit Increases

Same as for retirement.

**Retirement After
Disability
Eligibility**

Normal retirement age if still totally and permanently disabled.

Amount

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 who dies before retirement benefits commence, if age 50 with 3 years of Allowable Service or any age with 30 years of Allowable Service. If the Member dies before age 55, benefits commence when Member would have been age 55.

**TABLE 14B
NEW
(cont)**

Amount	Survivor's payment of the 100% joint and survivor benefit the Member could have elected if terminated.
Benefit Increases	Same as for a retired person if payments have been made over three years. The allocation is based on the years of service if the person on whose behalf the annuity is paid and the years receiving payment.
Refund of Member's Contributions Eligibility	Member or former Member dies before receiving any disability or retirement benefits and survivor benefits are not payable.
Amount	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 Eligibility	Termination of teaching service.
Amount	Member's contributions with 5% interest if termination occurred before May 16, 1989, or 6% interest if death occurred on or after May 16, 1989. A deferred annuity may be elected in lieu of a refund.
Deferred Annuity Eligibility	3 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.