

**DULUTH TEACHERS' RETIREMENT FUND**

**ACTUARIAL VALUATION REPORT**

**JULY 1, 1986**

December 18, 1986

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

**RE: DULUTH TEACHERS' RETIREMENT FUND**


Gentlemen:

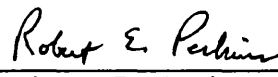
We have prepared an actuarial valuation of the Fund as of July 1, 1986 based on membership and financial data supplied by the Fund.

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 June 30, 1986 and amended on July 21 and July 28 of 1986.

Respectfully submitted,

THE WYATT COMPANY

  
Allan J. Grosh, FSA  
Consulting Actuary

  
Robert E. Perkins, FSA  
Consulting Actuary

## DULUTH TEACHERS' RETIREMENT FUND

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# DULUTH TEACHERS' RETIREMENT FUND

## REPORT HIGHLIGHTS (DOLLARS IN THOUSANDS)

	<u>07/01/85</u> <u>VALUATION</u>	<u>07/01/86</u> <u>VALUATION</u>
<b>A. CONTRIBUTIONS (TABLE 11)</b>		
1. Statutory Contributions - Chapter 354A % of Payroll	10.29%	10.29%
2. Required Contributions - Chapter 356 % of Payroll	11.55%	11.02%
3. Sufficiency (Deficiency) (A1-A2)	-1.26%	-0.73%
<b>B. FUNDING RATIOS</b>		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	\$53,839	\$64,673
b. Current Benefit Obligations (Table 8)	\$64,730	\$70,954
c. Funding Ratio (a/b)	83.17%	91.15%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	\$53,839	\$64,673
b. Actuarial Accrued Liability (Table 9)	\$71,154	\$78,011
c. Funding Ratio (a/b)	75.67%	82.90%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	\$95,064	\$107,393
b. Current and Expected Future Benefit Obligations	\$102,842	\$112,037
c. Funding Ratio (a/b)	92.44%	95.85%
<b>C. PLAN PARTICIPANTS</b>		
1. Active Members		
a. Number (Table 3)	1,182	1,251
b. Projected Annual Earnings	\$31,222	\$33,497
c. Average Annual Earnings (Actual \$)	\$26,415	\$26,776
d. Average Age	43.5	43.5
e. Average Service	12.0	11.5
2. Others		
a. Service Retirements (Table 4)	562	576
b. Disability Retirements (Table 5)	8	7
c. Survivors (Table 6)	23	25
d. Deferred Retirements (Table 7)	50	58
e. Terminated Other Non-vested (Table 7)	0	0
f. Total	643	666

## 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 not sufficient for 1986 by an amount of 0.73% of payroll. According to this valuation a contribution rate of 11.02% is required to comply with Minnesota Law.

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 funding progress. This ratio is based on the Proposed Statement of Governmental Accounting Standards. This year's ratio is 91.15%. The corresponding ratio for the prior year was 83.17%.
- 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 1986 the ratio is 82.90%, which is an

increase from the 1985 value of 75.67%.

- 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

Beginning in 1984, changes in Section 356.215 of Minnesota Statutes require that the asset value used for actuarial purposes reflect a portion of the unrealized gains and losses. Only a portion of these gains and losses are considered because market values are typically volatile and could produce erratic changes in the contribution requirements from year to year.

The calculation of assets for actuarial purposes begins with the reporting of Total Assets by the Fund (Table 1, line B). These Total Assets, reduced by any Amounts Currently Payable (line C), produce the Assets Available for Benefits (line D5), which is the starting value for determining the Actuarial Value of Assets.

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

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 MPRIF appears on some of the tables with a corresponding value of zero. MPRIF 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 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 is shown in Tables 7 and 15. The data adjustment entry for the service retirements reduces the amounts previously reported to be consistent with the benefits that are reported in Table 4.

### Actuarial Balance Sheet

An actuarial balance sheet is required by Section 356.215, Subdivision 4f of Minnesota Law. This balance sheet (Table 8) establishes a method for evaluating both 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. The difference between the obligations and the assets is shown as Current Unfunded Liability on line G.

The measurement of the Current Benefit Obligation is based on the Proposed Statement of Governmental Accounting Standards published by the Governmental Accounting Standards Board (GASB) in August 1985. This value is known as the Actuarial Present Value of Credited Projected Benefits.

The first step in the GASB calculation for active members involves projecting salaries and service to determine future benefits payable under the plan and then discounting those projected benefits to the date of the valuation. The second step is to determine the discounted value of benefits for the non-active members. The result of the first two steps is shown on line F, Total Current and Expected Future Benefit Obligations.

The third step is to determine the portion that represents Current Benefit Obligations. In the case of active members the Current Benefit Obligation is computed by attributing an equal benefit amount to each year of credited and expected future employee service. For all others, their entire liability is considered a Current Benefit Obligation.

Current and future funding levels are evaluated by comparing Current and Future Expected Assets on line C to Current and Expected Future Benefit Obligations on line F. The difference between the obligations and the assets is shown as the Current and Future Unfunded Liability on line H.

Since line F has already been calculated, the remaining step is to determine the Expected Future Assets . The statutory contribution rate in excess of the combined normal cost rate and expense rate is first calculated. The amount of assets for line B1 can be determined by projecting from the valuation date to the amortization date (the date for paying off all unfunded liabilities) on the assumption that total payroll is increasing at 6.5% annually and then discounted to the date of the valuation.

The Current Unfunded Liability, line G, is a measurement of the status of the funding to the date of the valuation. The Current and Future Unfunded Liability is a measurement of the adequacy of the current statutory contribution level.

#### Contribution Sufficiency

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal 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) shows similarities and differences. The similarity is that both approaches calculate the value of all future benefits the same way. This can be verified by comparing line F of Table 8 to line A6, column 1, of Table 9. The difference arises from the technique for allocating liabilities between 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.

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal 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. Prior to 1984 these payments were calculated to be a level dollar amount similar to a fixed interest rate mortgage. The method of funding was changed in 1984 to produce a series of payments that remain a constant percentage of payroll each year.

Under this new approach the payments will increase 6.5% each year since 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 begin to cover not only the interest but also repay a portion of the unfunded.

#### Projected Cash Flow

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 are made from the Fund.

This projected cash flow assumes that future payrolls increase by 6.5%. For purposes of this table only, 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% 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.

### Plan Provisions

The eligibility for the Surviving Spouse Optional Annuity has been changed by decreasing the age requirement from age 55 to age 50. However, the earliest age for benefits to commence remains age 55. As a result, the increase in the Actuarial Accrued Liability (Table 10, line F) is less than 0.02%.

### Old and New

Table 2 allocates the Current Assets between the Old and New Programs based on the following assumptions:

- o Lines G1 and G2 were allocated on reported payroll.
- o Line H1 was allocated on benefit payments.
- o Refunds were allocated by assuming one third was from Old Plan.
- o Expenses were allocated based on beginning of the year assets (Line F1).
- o The Transfers at Retirement, line K2, represents the present value of benefits for those Old Plan members who elected benefits under the New Plan.

The Statutes also require the disclosure of the contribution required to meet the interest at the assumed rate on the Actuarial Unfunded Accrued Liability. The following table compares the required contribution which funds the Unfunded by the year 2009 as a level percentage of payroll to the contribution which provides for interest on the Unfunded. As noted in the section on Contribution Sufficiency, the amount of the Unfunded will increase under the amortization

approach because payments for the next several years will not be sufficient to cover interest.

	<u>Required Contribution Rate</u>	
	<u>Amortization of Unfunded</u>	<u>Interest on Unfunded</u>
Old	11.33%	12.34%
New	9.21%	9.13%
Combined	11.02%	11.87%

TABLE 1

## DULUTH TEACHERS' RETIREMENT FUND

ACCOUNTING BALANCE SHEET  
(DOLLARS IN THOUSANDS)

July 1, 1986

	<u>MARKET VALUE</u>	<u>COST VALUE</u>
A. ASSETS		
1. Cash and Cash Equivalents	\$7,520	\$7,520
2. Investments		
a. Fixed Income	21,733	17,997
b. Equity	51,065	29,238
c. Real Estate	62	62
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	0	0
4. Other	1,337	1,337
	-----	-----
B. TOTAL ASSETS	<u>\$81,717</u>	<u>\$56,154</u>
	=====	=====
C. AMOUNTS CURRENTLY PAYABLE	\$2	\$2
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	\$11,064	\$11,064
2. Employer Reserves	70,651	45,088
3. MPRIF Reserves	0	0
4. Non-MPRIF Reserves	0	0
	-----	-----
5. Total Assets Available for Benefits	<u>\$81,715</u>	<u>\$56,152</u>
	-----	-----
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	<u>\$81,717</u>	<u>\$56,154</u>
	=====	=====
F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS		
1. Cost Value of Assets Available for Benefits (D5)		\$56,152
2. Market Value (D5)	\$81,715	
3. Cost Value (D5)	56,152	
	-----	
4. Market Over Cost (F2-F3)	\$25,563	
5. 1/3 of Market Over Cost (F4)/3		8,521
		-----
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		<u>\$64,673</u>
		=====

TABLE 2

## DULUTH TEACHERS' RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1986

	<u>MARKET VALUE</u>	<u>COST VALUE</u>
A. ASSETS AVAILABLE AT BEGINNING OF YEAR	\$62,852	\$49,333
B. OPERATING REVENUES		
1. Member Contributions	\$1,513	\$1,513
2. Employer Contributions	1,897	1,897
3. Investment Income	3,405	3,405
4. MPRIF Income	0	0
5. Net Realized Gain (Loss)	3,840	3,840
6. Other	1	1
7. Net Change in Unrealized Gain (Loss)	12,044	0
	-----	-----
8. Total Revenue	\$22,700	\$10,656
	-----	-----
C. OPERATING EXPENSES		
1. Service Retirements	\$3,256	\$3,256
2. Disability Benefits	35	35
3. Survivor Benefits	92	92
4. Refunds	191	191
5. Expenses	263	263
6. Other	0	0
	-----	-----
7. Total Disbursements	\$3,837	\$3,837
	-----	-----
D. CHANGES IN ACCOUNTING METHOD	0	0
E. ASSETS AVAILABLE AT END OF YEAR	\$81,715	\$56,152
	=====	=====

TABLE 2  
(cont)

## DULUTH TEACHERS' RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1986

	<u>OLD</u>	<u>NEW</u>	<u>TOTAL</u>
F. BEGINNING OF YEAR			
1. Current Assets	\$48,847	\$4,992	\$53,839
2. MPRIF Reserves	0	0	0
3. Allocable Assets(A1-A2)	48,847	4,992	53,839
G. RECEIPTS			
1. Member Contributions	1,291 *	222 *	1,513
2. Employer Contributions	1,619 *	278 *	1,897
3. Other	1 *	0 *	1
	-----	-----	-----
4. Total	2,911	500	3,411
H. DISBURSEMENTS			
1. MPRIF New Annuitants	0	0	0
2. Non-MPRIF Benefits	2,656 *	727 *	3,383
3. Refunds	64 *	127 *	191
4. Expenses	239 *	24 *	263
5. Other	0	0	0
	-----	-----	-----
6. Total	2,959	878	3,837
I. EXPECTED INVESTMENT RETURN 8% OF (F3+.5XG4-.5XH6)	3,906	384	4,290
J. ALLOCATION OF REMAINING ASSETS IN PROPORTION TO LINE I	6,346	624	6,970
K. END OF YEAR			
1. Allocable Assets	59,051	5,622	64,673
2. Transfers at Retirement	(2,691)	2,691	0
3. Current Assets	56,360	8,313	64,673

\* Allocated by Wyatt



TABLE 3

## DULUTH TEACHERS' RETIREMENT FUND

## ACTIVE MEMBERS AS OF JUNE 30, 1986

AGE	YEARS OF SERVICE								TOTAL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	2	4							6
25-29	11	28	1						40
30-34	95	75	41	6					217
35-39	21	64	40	77	22				224
40-44	8	30	34	51	91	18			232
45-49	8	20	22	34	54	36	11		185
50-54	5	10	13	28	40	41	36	3	176
55-59	1	5	7	23	31	24	30	13	134
60-64			2	9	11	5	4	2	33
65+	1		1			1	1		4
TOTAL	152	236	161	228	249	125	82	18	1,251

## AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE								ALL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	10,019	14,990							13,333
25-29	5,144	14,974	20,815						12,417
30-34	4,844	15,433	21,221	21,935					12,070
35-39	6,689	16,293	22,982	29,972	34,183				23,046
40-44	8,988	19,389	22,772	31,095	32,793	34,449			28,526
45-49	4,124	19,293	25,691	31,779	33,564	33,709	35,426		29,623
50-54	5,267	21,630	28,085	33,041	31,345	34,874	35,231	48,247	31,986
55-59		12,611	19,051	29,587	33,266	33,030	35,315	36,208	31,575
60-64			15,547	30,108	33,896	33,800	34,453	33,757	31,795
65+	1,220		18,982			31,976	33,421		21,400
ALL	5,327	16,637	22,970	30,625	32,958	34,057	35,228	37,942	25,141

## 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
810	3,926	3,698	6,982	8,207	4,257	2,889	683	31,452

TABLE 4

## DULUTH TEACHERS' RETIREMENT FUND

## SERVICE RETIREMENTS AS OF JUNE 30, 1986

AGE	YEARS RETIRED							TOTAL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								0
50-54								0
55-59	22	34						56
60-64	9	66	18					93
65-69	1	48	43	10				102
70-74		1	50	30	1			82
75-79				75	26	1		102
80-84				11	47	9	1	68
85+					13	33	27	73
TOTAL	32	149	111	126	87	43	28	576

## AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								0
50-54								0
55-59	7,840	4,820						6,006
60-64	7,696	5,972	3,007					5,565
65-69	10,926	5,314	4,015	1,942				4,491
70-74		159	4,059	3,502	3,423			3,800
75-79				3,830	3,353	1,723		3,688
80-84				4,736	3,606	3,075	2,498	3,702
85+					3,658	3,218	3,001	3,216
ALL	7,896	5,458	3,871	3,682	3,536	3,153	2,983	4,316

## TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
253	811	430	464	308	136	84	2,486

TABLE 5

## DULUTH TEACHERS' RETIREMENT FUND

## DISABILITY RETIREMENTS AS OF JUNE 30, 1986

AGE	YEARS DISABLED							TOTAL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								0
50-54				1				1
55-59		1	1					2
60-64		3						3
65-69								0
70-74								0
75-79								0
80-84								0
85+							1	1
TOTAL	0	4	1	1	0	0	1	7

## AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								0
50-54				2,724				2,724
55-59		5,374	2,381					3,878
60-64		4,780						4,780
65-69								0
70-74								0
75-79								0
80-84								0
85+							1,090	1,090
TOTAL	0	4,929	2,381	2,724	0	0	1,090	3,701

## TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	20	2	3	0	0	1	26

TABLE 6

## DULUTH TEACHERS' RETIREMENT FUND

## SURVIVORS AS OF JUNE 30, 1986

AGE	YEARS SINCE DEATH							TOTAL
	<u>&lt;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								0
60-64		2			1			3
65-69			2	3	3			8
70-74			3	1				4
75-79		1	1	2	1			5
80-84				1	1			2
85+				1		2		3
TOTAL	0	3	6	8	6	2	0	25

## AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH							ALL
	<u>&lt;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								0
60-64		5,828			902			4,186
65-69			4,061	1,819	1,561			2,283
70-74			3,384	1,856				3,002
75-79		2,520	4,580	4,106	2,389			3,540
80-84				1,909	1,453			1,681
85+				1,675		1,494		1,554
ALL	0	4,725	3,809	2,389	1,571	1,494	0	2,742

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH							
<u>&lt;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	14	24	19	9	3	0	69

TABLE 7

**DULUTH TEACHERS' RETIREMENT FUND**  
**RECONCILIATION OF MEMBERS**

	<u>ACTIVES</u>	<u>TERMINATED</u>	
		<u>DEFERRED RETIREMENT</u>	<u>OTHER NON-VESTED</u>
A. On June 30, 1985	1,182	50	0
B. Additions	132	11	0
C. Deletions:			
1. Service Retirement	(31)	(1)	
2. Disability	0	0	
3. Death	0	0	
4. Terminated-Deferred	(11)		
5. Terminated-Refund	(28)	(2)	0
6. Terminated-Other Non-vested	0	0	0
7. Returned as Active			0
D. Data Adjustments	7	0	0
	Vested 702		
	Non-Vested 549		
E. Total on June 30, 1986	1,251	58	0

	<u>RECIPIENTS</u>		
	<u>RETIREMENT ANNUITANTS</u>	<u>DISABLED</u>	<u>SURVIVORS</u>
A. On June 30, 1985	562	8	23
B. Additions	32	0	2
C. Deletions:			
1. Service Retirement		0	
2. Death	(18)	(1)	0
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	
D. Data Adjustments	0	0	0
E. Total on June 30, 1986	576	7	25

# DULUTH TEACHERS' RETIREMENT FUND

TABLE 8

## ACTUARIAL BALANCE SHEET (DOLLARS IN THOUSANDS)

JULY 1, 1986

A. CURRENT ASSETS (TABLE 1, F6)				\$64,673
B. EXPECTED FUTURE ASSETS				
1. Present Value of Expected Future Supplemental Contributions				8,694
2. Present Value of Future Normal Costs				34,026
3. Total Expected Future Assets				42,720
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS				\$107,393
D. CURRENT BENEFIT OBLIGATIONS	<u>Non-Vested</u>	<u>Vested</u>	<u>Total</u>	
1. Benefit Recipients				
a. Retirement Annuities		\$23,315		\$23,315
b. Disability Benefits		190		190
c. Surviving Spouse's Benefits		573		573
d. Surviving Children's Benefits		0		0
2. Deferred Retirements		405		405
3. Former Members without Vested Rights		0		0
4. Active Members				
a. Retirement Annuities	2,199	37,592		39,791
b. Disability Benefits	257	2,452		2,709
c. Survivors' Benefits	86	1,229		1,315
d. Deferred Retirements	144	1,857		2,001
e. Refund Liability Due to Death or Withdrawal	320	335		655
5. Total Current Benefit Obligations	\$3,006	\$67,948		\$70,954
E. EXPECTED FUTURE BENEFIT OBLIGATIONS				\$41,083
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS				\$112,037
G. CURRENT UNFUNDED LIABILITY (D5-A)				\$6,281
H. CURRENT AND FUTURE UNFUNDED LIABILITY (F-C)				\$4,644

TABLE 9

## DULUTH TEACHERS' RETIREMENT FUND

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

JULY 1, 1986

	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	\$76,718	\$27,036	\$49,682
b. Disability Benefits	4,531	2,344	2,187
c. Survivors Benefits	2,225	871	1,354
d. Deferred Retirements	2,795	1,541	1,254
e. Refunds Due to Death or Withdrawal	1,284	2,234	(950)
f. Total	<u>\$87,553</u>	<u>\$34,026</u>	<u>\$53,527</u>
2. Deferred Retirements	\$405		\$405
3. Former Members Without Vested Rights	0		0
4. Annuitants in MPRIF	0		0
5. Recipients Not in MPRIF	24,079		24,079
6. Total AAL	<u>\$112,037</u>	<u>\$34,026</u>	<u>\$78,011</u>
B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)			
1. AAL (A6)			\$78,011
2. Current Assets (Table 1,F6)			64,673
3. UAAL (B1-B2)			<u>\$13,338</u>
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE			
1. Present Value of Future Payrolls Through the Amortization Date of July 1, 2009			\$636,301
2. Supplemental Contribution Rate (B3/C1)			2.10%

TABLE 10

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

**YEAR ENDING JUNE 30, 1986**

A. UAAL AT BEGINNING OF YEAR	\$17,315
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	\$2,946
2. Contribution	(3,410)
3. Interest on A, B1, and B2	1,367
	-----
4. Total (B1+B2+B3)	\$903
	-----
C. EXPECTED UAAL AT END OF YEAR (A+B4)	\$18,218
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	\$179
2. Investment Return	(6,970)
3. MPRIF Mortality	0
4. Mortality of Other Benefit Recipients	135
5. Other Items	1,757
	-----
6. Total	(\$4,899)
	-----
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	\$13,319
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	\$19
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	\$0
	-----
H. UAAL AT END OF YEAR (E+F+G)	\$13,338
	=====



TABLE 11

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

JULY 1, 1986

	<u>% OF PAYROLL</u>	<u>\$ AMOUNT</u>
<b>A. STATUTORY CONTRIBUTIONS - CHAPTER 354A</b>		
1. Employee Contributions	4.50%	\$1,507
2. Employer Contributions	5.79%	1,939
	-----	-----
3. Total	10.29%	\$3,446
	=====	=====
<b>B. REQUIRED CONTRIBUTIONS - CHAPTER 356</b>		
1. Normal Cost		
a. Retirement Benefits	6.54%	\$2,195
b. Disability Benefits	0.54%	180
c. Survivors	0.21%	71
d. Deferred Retirement Benefits	0.36%	119
e. Refunds Due to Death or Withdrawal	0.49%	163
	-----	-----
f. Total	8.14%	\$2,728
	-----	-----
2. Supplemental Contribution Amortization by July 1, 2009 of UAAL of \$13,338	2.10%	\$702
3. Allowance for Expenses	0.78%	\$261
	-----	-----
4. Total	11.02%	\$3,691
<b>C. CONTRIBUTION SUFFICIENCY (DEFICIENCY)</b>		
(A3-B4)	-0.73%	(\$245)

Note: Projected Annual Payroll for Fiscal Year Beginning  
on July 1, 1986 is \$33,497

TABLE 12

## DULUTH TEACHERS' RETIREMENT FUND

PROJECTED CASH FLOW  
(DOLLARS IN THOUSANDS)

<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>
1986					\$64,673
1987	\$3,446	\$0	\$3,905	\$5,156	69,370
1988	3,671	0	3,923	5,540	74,658
1989	3,910	0	3,904	5,973	80,637
1990	4,163	0	3,966	6,459	87,293
1991	4,434	0	4,113	6,997	94,611
1992	4,722	0	4,265	7,587	102,655
1993	5,029	0	4,601	8,230	111,313
1994	5,356	0	5,150	8,913	120,432
1995	5,705	0	5,626	9,638	130,149
1996	6,075	0	6,235	10,405	140,394
1997	6,470	0	7,124	11,205	150,945
1998	6,891	0	7,811	12,038	162,063
1999	7,339	0	8,655	12,913	173,660
2000	7,816	0	9,300	13,834	186,010
2001	8,323	0	10,187	14,806	198,952
2002	8,865	0	11,046	15,829	212,600
2003	9,441	0	12,165	16,899	226,775
2004	10,055	0	13,188	18,017	241,659
2005	10,708	0	14,183	19,193	257,377
2006	11,404	0	15,506	20,426	273,701
2007	12,145	0	17,248	21,692	290,290
2008	12,935	0	18,853	22,986	307,358
2009	13,775	0	20,113	24,335	325,355
2010	14,671	0	21,268	25,765	344,523
2011	15,624	0	22,968	27,268	364,447

**DULUTH TEACHERS' RETIREMENT FUND**  
**SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS**

Interest:	Pre-Retirement: 8% per annum
	Post-Retirement: 8% 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 GAM female rates
	Female - 1971 GAM female rates
	Post-Retirement:
	Male - Same as above
	Female - Same as above
Retirement Age:	Post-Disability:
	Male - 1977 RRB rates
	Female - 1977 RRB rates
	Old Plan: Age 63 New Plan: Age 63 with 30 years of service or age 65. Plus 50 % of employees eligible for Rule of 85 are assumed to retire on June 30, 1985 and remainder of eligible employees retire on June 30, 1986.
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. (0.78% of payroll)
Return of Contributions:	Employees withdrawing after 10 years of service were assumed to choose a refund only if the amount of their accumulated contributions is greater than the present value of the deferred retirement 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:	Annual bonus payment totaling 1% of the year end assets is accounted for by using a 7% post and pre-retirement interest rate. Members in the Old Plan who were hired prior to age 33 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.
Actuarial Cost Method:	Entry Age Normal Cost Method with normal costs expressed as a level percentage of earnings. Under this method Actuarial Gains(Losses) reduce(increase) the Unfunded Actuarial Accrued Liability.
Asset Valuation Method:	Cost Value plus one-third Unrealized Gains or Losses.
Payment on the Unfunded Actuarial Accrued Liability:	A level percentage of payroll each year to the statutory amortization date assuming payroll increases of 6.5% per annum.
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	3	3	2,000	2,000	28	28	0	0
21	3	3	1,931	1,931	28	28	0	0
22	3	3	1,731	1,731	28	28	0	0
23	3	3	1,532	1,532	28	28	0	0
24	3	3	1,332	1,332	28	28	0	0
25	3	3	1,132	1,132	28	28	0	0
26	4	4	932	932	28	28	0	0
27	4	4	732	732	28	28	0	0
28	4	4	703	703	28	28	0	0
29	4	4	673	673	28	28	0	0
30	5	5	643	643	28	28	0	0
31	5	5	612	612	28	28	0	0
32	5	5	582	582	28	28	0	0
33	6	6	552	552	28	28	0	0
34	6	6	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	11	11	325	325	35	35	0	0
43	12	12	304	304	37	37	0	0
44	13	13	282	282	38	38	0	0
45	14	14	260	260	41	41	0	0
46	15	15	237	237	43	43	0	0
47	17	17	214	214	46	46	0	0
48	18	18	191	191	49	49	0	0
49	20	20	167	167	53	53	0	0
50	22	22	143	143	57	57	0	0
51	23	23	118	118	62	62	0	0
52	25	25	92	92	68	68	0	0
53	27	27	67	67	74	74	0	0
54	30	30	40	40	80	80	0	0

TABLE 13  
(cont)

<u>Age</u>	<u>Death</u>		<u>Withdrawal</u>		<u>Disability</u>		<u>Retirement</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
55	33	33	13	13	87	87	0	0
56	36	36	0	0	95	95	0	0
57	39	39	0	0	104	104	0	0
58	44	44	0	0	114	114	0	0
59	49	49	0	0	125	125	0	0
60	55	55	0	0	136	136	0	0
61	62	62	0	0	149	149	0	0
62	69	69	0	0	163	163	0	0
63	77	77	0	0	0	0	10,000	10,000
64	86	86	0	0	0	0	0	0
65	96	96	0	0	0	0	0	0
66	106	106	0	0	0	0	0	0
67	116	116	0	0	0	0	0	0
68	129	129	0	0	0	0	0	0
69	145	145	0	0	0	0	0	0
70	165	165	0	0	0	0	0	0

TABLE 15

## DULUTH TEACHERS' RETIREMENT FUND

MEMBERSHIP CHANGES  
(DOLLARS IN THOUSANDS)

JUNE 30, 1986

A. ACTIVE MEMBERS		
	<u>NUMBER</u>	<u>PAYROLL</u>
1. As of the Last Valuation Date	1,182	\$29,317
2. New Entrants	132	1,494
3. Total	1,314	30,811
4. Separations from Active Service		
a. Refund of Contributions	(28)	(330)
b. Separation with Deferred Annuity	(11)	NA
c. Separation with neither Refund nor Deferred Annuity	0	0
d. Disability	0	0
e. Death	0	0
f. Retirement with Service Annuity	(31)	NA
5. Total Separations	(70)	NA
6. Data Adjustments	7	971
7. As of Current Valuation Date	1,251	\$31,452
B. SERVICE RETIREMENT ANNUITANTS		
	<u>NUMBER</u>	<u>ANNUAL ANNUITY</u>
1. As of the Last Valuation Date	562	\$2,273
2. New Entrants	32	304
3. Total	594	2,577
4. Terminations		
a. Deaths	(18)	(61)
b. Others	0	0
5. Total Terminations	(18)	(61)
6. Data Adjustments	0	(30)
7. As of Current Valuation Date	576	\$2,486
C. DISABLED ANNUITANTS		
	<u>NUMBER</u>	<u>ANNUAL ANNUITY</u>
1. As of the Last Valuation Date	8	\$32
2. New Entrants	0	0
3. Total	8	32
4. Terminations		
a. Deaths	(1)	(6)
b. Others	0	0
5. Total Terminations	(1)	(6)
6. Data Adjustments	0	0
7. As of Current Valuation Date	7	\$26

TABLE 15

(cont)

		<u>NUMBER</u>	<u>ANNUAL ANNUITY</u>
D. SURVIVING SPOUSE ANNUITANTS			
1. As of the Last Valuation Date		23	\$61
2. New Entrants		2	8
3. Total		25	69
4. Terminations			
a. Deaths		0	0
b. Others		0	0
5. Total Terminations		0	0
6. Data Adjustments		0	0
7. As of Current Valuation Date		25	\$69
E. SURVIVING CHILDREN ANNUITANTS			
1. As of the Last Valuation Date		0	\$0
2. New Entrants		0	0
3. Total		0	0
4. Terminations			
a. Deaths		0	0
b. Others		0	0
5. Total Terminations		0	0
6. Data Adjustments		0	0
7. As of Current Valuation Date		0	\$0
F. DEFERRED ANNUITANTS			
1. As of the Last Valuation Date		50	\$59
2. New Entrants		11	8
3. Total		61	67
4. Terminations			
a. Deaths		0	0
b. Others		(3)	(4)
5. Total Terminations		(3)	(4)
6. Data Adjustments		0	0
7. As of Current Valuation Date		58	\$63



# DULUTH TEACHERS' RETIREMENT FUND

OLD

## REPORT HIGHLIGHTS (DOLLARS IN THOUSANDS)

	<u>07/01/85 VALUATION</u>	<u>07/01/86 VALUATION</u>
<b>A. CONTRIBUTIONS (TABLE 11A)</b>		
1. Statutory Contributions - Chapter 354A % of Payroll	10.29%	10.29%
2. Required Contributions - Chapter 356 % of Payroll	11.85%	11.33%
3. Sufficiency (Deficiency) (A1-A2)	-1.56%	-1.04%
<b>B. FUNDING RATIOS</b>		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 2)	\$48,847	\$56,360
b. Current Benefit Obligations (Table 8A)	\$59,935	\$62,906
c. Funding Ratio (a/b)	81.50%	89.59%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 2)	\$48,847	\$56,360
b. Actuarial Accrued Liability (Table 9A)	\$66,294	\$69,888
c. Funding Ratio (a/b)	73.68%	80.64%
3. Projected Benefit Funding Ratio (Table 8A)		
a. Current and Expected Future Assets	\$85,024	\$91,388
b. Current and Expected Future Benefit Obligations	\$93,634	\$97,043
c. Funding Ratio (a/b)	90.80%	94.17%
<b>C. PLAN PARTICIPANTS</b>		
1. Active Members		
a. Number (Table 3A)	924	883
b. Projected Annual Earnings	\$27,991	\$28,584
c. Average Annual Earnings (Actual \$)	\$30,293	\$32,371
d. Average Age	46.0	46.7
e. Average Service	15.0	15.7
2. Others		
a. Service Retirements (Table 4A)	514	504
b. Disability Retirements (Table 5A)	8	7
c. Survivors (Table 6A)	23	25
d. Deferred Retirements (Table 7A)	47	57
e. Terminated Other Non-vested (Table 7A)	0	0
f. Total	592	593

# DULUTH TEACHERS' RETIREMENT FUND

TABLE 3A  
OLD

## ACTIVE MEMBERS AS OF JUNE 30, 1986

AGE	YEARS OF SERVICE								TOTAL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25									0
25-29		3	1						4
30-34	1	8	40	6					55
35-39		7	37	77	22				143
40-44		2	34	51	91	18			196
45-49	1	3	21	34	54	36	11		160
50-54			13	28	40	41	36	3	161
55-59			7	23	31	24	30	13	128
60-64			2	9	11	5	4	2	33
65+			1			1	1		3
TOTAL	2	23	156	228	249	125	82	18	883

## 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		6,767	20,815						10,279
30-34		13,327	21,154	21,935					19,716
35-39		6,851	23,317	29,972	34,183				27,766
40-44		8,207	22,772	31,095	32,793	34,449			30,514
45-49		12,355	25,744	31,779	33,564	33,709	35,426		31,711
50-54			28,085	33,041	31,345	34,874	35,231	48,247	33,459
55-59			19,051	29,587	33,266	33,030	35,315	36,208	32,562
60-64			15,547	30,108	33,896	33,800	34,453	33,757	31,795
65+			18,982			31,976	33,421		28,126
ALL	0	9,929	23,032	30,625	32,958	34,057	35,228	37,942	30,395

## 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	228	3,593	6,982	8,207	4,257	2,889	683	26,839

# DULUTH TEACHERS' RETIREMENT FUND

TABLE 4A  
OLD

## SERVICE RETIREMENTS AS OF JUNE 30, 1986

AGE	YEARS RETIRED							TOTAL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								0
50-54								0
55-59	5	19						24
60-64	3	44	18					65
65-69		37	43	10				90
70-74		1	50	30	1			82
75-79				75	26	1		102
80-84				11	47	9	1	68
85+					13	33	27	73
TOTAL	8	101	111	126	87	43	28	504

## AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								0
50-54								0
55-59	5,104	3,453						3,797
60-64	5,185	5,066	3,007					4,501
65-69		4,904	4,015	1,942				4,150
70-74		159	4,059	3,502	3,423			3,800
75-79				3,830	3,353	1,723		3,688
80-84				4,736	3,606	3,075	2,498	3,702
85+					3,658	3,218	3,001	3,216
ALL	5,134	4,655	3,871	3,682	3,536	3,153	2,983	3,832

## TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
41	469	430	464	308	136	84	1,932

# DULUTH TEACHERS' RETIREMENT FUND

TABLE 5A  
OLD

## DISABILITY RETIREMENTS AS OF JUNE 30, 1986

AGE	YEARS DISABLED							TOTAL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								0
50-54				1				1
55-59		1	1					2
60-64		3						3
65-69								0
70-74								0
75-79								0
80-84								0
85+							1	1
TOTAL	0	4	1	1	0	0	1	7

## AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED							ALL
	<1	1-4	5-9	10-14	15-19	20-24	25+	
<50								0
50-54				2,724				2,724
55-59		5,374	2,381					3,878
60-64		4,780						4,780
65-69								0
70-74								0
75-79								0
80-84								0
85+							1,090	1,090
TOTAL	0	4,929	2,381	2,724	0	0	1,090	3,701

## TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	20	2	3	0	0	1	26

# DULUTH TEACHERS' RETIREMENT FUND

TABLE 6A  
OLD

SURVIVORS AS OF JUNE 30, 1986

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		2			1			3
65-69			2	3	3			8
70-74			3	1				4
75-79		1	1	2	1			5
80-84				1	1			2
85+				1		2		3
TOTAL	0	3	6	8	6	2	0	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		5,828			902			4,186
65-69			4,061	1,819	1,561			2,283
70-74			3,384	1,856				3,002
75-79		2,520	4,580	4,106	2,389			3,540
80-84				1,909	1,453			1,681
85+				1,675		1,494		1,554
ALL	0	4,725	3,809	2,389	1,571	1,494	0	2,742

## TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	14	24	19	9	3	0	69

**DULUTH TEACHERS' RETIREMENT FUND**  
**RECONCILIATION OF MEMBERS**

TABLE 7A  
OLD

		<u>TERMINATED</u>	
	<u>ACTIVES</u>	<u>DEFERRED RETIREMENT</u>	<u>OTHER NON-VESTED</u>
A. On June 30, 1985	924	47	0
B. Additions	0	11	0
C. Deletions:			
1. Service Retirement	(29)	0	
2. Disability	0		
3. Death	0	0	
4. Terminated-Deferred	(8)		
5. Terminated-Refund	(9)	(2)	0
6. Terminated-Other Non-vested	0		
7. Returned as Active		0	0
D. Data Adjustments	5	1	0
	Vested		
	Non-Vested		
	702		
	181		
E. Total on June 30, 1986	883	57	0

	<u>RECIPIENTS</u>		
	<u>RETIREMENT ANNUITANTS</u>	<u>DISABLED</u>	<u>SURVIVORS</u>
A. On June 30, 1985	514	8	23
B. Additions	8	0	2
C. Deletions:			
1. Service Retirement		0	
2. Death	(18)	(1)	0
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	
D. Data Adjustments	0	0	0
E. Total on June 30, 1986	504	7	25

# DULUTH TEACHERS' RETIREMENT FUND

TABLE 8A  
OLD

## ACTUARIAL BALANCE SHEET (DOLLARS IN THOUSANDS)

JULY 1, 1986

A. CURRENT ASSETS (TABLE 2, K3)				\$56,360
B. EXPECTED FUTURE ASSETS				
1. Present Value of Expected Future Supplemental Contributions				7,873
2. Present Value of Future Normal Costs				27,155
				-----
3. Total Expected Future Assets				35,028
				-----
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS				\$91,388
				=====
D. CURRENT BENEFIT OBLIGATIONS	<u>Non-Vested</u>	<u>Vested</u>	<u>Total</u>	
1. Benefit Recipients				
a. Retirement Annuities		\$15,929		\$15,929
b. Disability Benefits		190		190
c. Surviving Spouse's Benefits		573		573
d. Surviving Children's Benefits		0		0
2. Deferred Retirements		404		404
3. Former Members without Vested Rights		0		0
4. Active Members				
a. Retirement Annuities	1,738	37,592		39,330
b. Disability Benefits	200	2,452		2,652
c. Survivors' Benefits	77	1,229		1,306
d. Deferred Retirements	139	1,857		1,996
e. Refund Liability Due to Death or Withdrawal	191	335		526
				-----
5. Total Current Benefit Obligations	\$2,345	\$60,561		\$62,906
				-----
E. EXPECTED FUTURE BENEFIT OBLIGATIONS				\$34,137
				-----
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS				\$97,043
				=====
G. CURRENT UNFUNDED LIABILITY (D5-A)				\$6,546
H. CURRENT AND FUTURE UNFUNDED LIABILITY (F-C)				\$5,655

# DULUTH TEACHERS' RETIREMENT FUND

TABLE 9A  
OLD

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

JULY 1, 1986

	ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS <u>(1)</u>	ACTUARIAL PRESENT VALUE OF FUTURE NORMAL COSTS <u>(2)</u>	ACTUARIAL ACCRUED LIABILITY <u>(3)=(1)-(2)</u>
<b>A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)</b>			
1. Active Members			
a. Retirement Annuities	\$70,400	\$21,344	\$49,056
b. Disability Benefits	3,963	1,831	2,132
c. Survivors Benefits	2,100	757	1,343
d. Deferred Retirements	2,742	1,493	1,249
e. Refunds Due to Death or Withdrawal	741	1,730	(989)
	-----	-----	-----
f. Total	\$79,946	\$27,155	\$52,791
	-----	-----	-----
2. Deferred Retirements	\$404		\$404
3. Former Members Without Vested Rights	0		0
4. Annuitants in MPRIF	0		0
5. Recipients Not in MPRIF	16,693		16,693
	-----	-----	-----
6. Total AAL	\$97,043	\$27,155	\$69,888
	=====	=====	=====
<b>B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)</b>			
1. AAL (A6)			\$69,888
2. Current Assets (Table 2, K3)			56,360
			-----
3. UAAL (B1-B2)			\$13,528
			=====
<b>C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE</b>			
1. Present Value of Future Payrolls to the Amortization Date of July 1, 2009			\$542,981
2. Supplemental Contribution Rate (B3/C1)			2.49%



DULUTH TEACHERS' RETIREMENT FUND

TABLE 10A  
OLD

CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)  
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1986

A. UAAL AT BEGINNING OF YEAR	\$17,447
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	\$2,493
2. Contribution	(2,910)
3. Interest on A, B1, and B2	1,379
	-----
4. Total (B1+B2+B3)	\$962
	-----
C. EXPECTED UAAL AT END OF YEAR (A+B4)	\$18,409
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	\$178
2. Investment Return	(6,346)
3. MPRIF Mortality	0
4. Mortality of Other Benefit Recipients	92
5. Other Items	1,176
	-----
6. Total	(\$4,900)
	-----
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	\$13,509
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	\$19
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	\$0
	-----
H. UAAL AT END OF YEAR (E+F+G)	\$13,528
	=====

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

TABLE 11A  
OLD

JULY 1, 1986

	<u>% OF PAYROLL</u>	<u>\$ AMOUNT</u>
<b>A. STATUTORY CONTRIBUTIONS - CHAPTER 354A</b>		
1. Employee Contributions	4.50%	\$1,286
2. Employer Contributions	5.79%	1,655
3. Total	----- 10.29% =====	----- \$2,941 =====
<b>B. REQUIRED CONTRIBUTIONS - CHAPTER 356</b>		
1. Normal Cost		
a. Retirement Benefits	6.45%	\$1,843
b. Disability Benefits	0.52%	149
c. Survivors	0.22%	64
d. Deferred Retirement Benefits	0.41%	116
e. Refunds Due to Death or Withdrawal	0.46%	132
f. Total	----- 8.06% -----	----- \$2,304 -----
2. Supplemental Contribution Amortization by July 1, 2009 of UAAL of \$13,528	2.49%	\$712
3. Allowance for Expenses	0.78%	\$223
4. Total	----- 11.33%	----- \$3,239
<b>C. CONTRIBUTION SUFFICIENCY (DEFICIENCY)     (A3-B4)</b>	-1.04%	(\$298)

Note: Projected Annual Payroll for Fiscal Year Beginning  
on July 1, 1986 is \$28,584

# DULUTH TEACHERS' RETIREMENT FUND

TABLE 12A  
OLD

## PROJECTED CASH FLOW JULY 1, 1986

<u>FISCAL YEAR</u>	<u>STATUTORY CONTRIBUTIONS</u>	<u>TRANSFERS TO NEW PLAN</u>	<u>OTHER DISBURSEMENTS</u>	<u>INVESTMENT RETURN</u>	<u>CURRENT ASSETS YEAR END</u>
1986					\$56,360
1987	\$2,941	\$1,824	\$2,817	\$4,441	59,101
1988	2,920	203	2,846	4,723	63,695
1989	2,997	72	2,850	5,099	68,869
1990	3,066	322	2,900	5,503	74,216
1991	3,101	78	3,067	5,936	80,108
1992	3,169	715	3,159	6,380	85,783
1993	3,186	1,660	3,322	6,791	90,778
1994	3,145	2,175	3,619	7,156	95,285
1995	3,139	1,968	3,843	7,516	100,129
1996	3,114	3,326	4,066	7,839	103,690
1997	3,006	5,386	4,349	8,026	104,987
1998	2,952	3,890	4,549	8,179	107,679
1999	2,854	4,645	4,846	8,349	109,391
2000	2,819	3,353	5,055	8,528	112,330
2001	2,749	5,581	5,222	8,664	112,940
2002	2,666	5,034	5,446	8,723	113,849
2003	2,536	8,485	5,581	8,647	110,966
2004	2,435	7,459	5,664	8,450	108,728
2005	2,306	6,321	5,880	8,302	107,135
2006	2,133	9,590	5,994	8,033	101,717
2007	1,840	13,828	6,093	7,414	91,050
2008	1,582	13,354	6,045	6,571	79,804
2009	1,393	9,799	5,959	5,810	71,249
2010	1,216	9,466	5,876	5,135	62,258
2011	955	10,929	5,894	4,346	50,736

**DULUTH TEACHERS' RETIREMENT FUND****TABLE 14A  
OLD****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 prorata basis.
Salary	Annual contract salary.
Average Salary	Average of the 5 highest years of annual salary.
<b>RETIREMENT</b>	
Normal Retirement Benefit	
Eligibility	Age 60 and 1 year of Allowable Service. Rule of 85: Age 55 and age plus Allowable Service totals 85 prior to 1/1/87, and retirement prior to 7/1/87.
Amount	1.25% of Average Salary for each year of Credited Service. 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 10 years of Credited Service.
Amount	Normal Retirement Benefit based on Credited Service and Average Salary at retirement date. The benefit is reduced 0.5% for each month the Member is under age 60.
Form of Payment	Life annuity. Actuarially equivalent options are: 5, 10, 15 or 20 year certain and life 50% or 100% bounce back joint and survivor (option is cancelled if Member is pre-deceased by beneficiary) 50% or 100% joint and survivor Other equivalent options approved by the Board.

TABLE 14A  
OLD  
(cont)

Benefit Increases	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.
-------------------	---

**DISABILITY**

Disability Benefit  
Eligibility

Totally and permanently disabled before the age of 60 with 5 years of Credited Service.

Amount

Normal Retirement Benefit based on Credited Service and Average Salary at disability date without reduction for early commencement. Amount is reduced for Worker's 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.

Return of Contributions II

Eligibility

Death of Member who terminated employment after 10 years of service.

Amount

Regular contributions accumulated with 5% interest.

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 in excess of benefits paid.

TABLE 14A  
OLD  
(cont)

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.

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. (Amended 1986)

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. 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. Amount is payable as a normal or early retirement.

# DULUTH TEACHERS' RETIREMENT FUND

TABLE 15A  
OLD

## MEMBERSHIP CHANGES (DOLLARS IN THOUSANDS)

JUNE 30, 1986

A. ACTIVE MEMBERS		<u>NUMBER</u>	<u>PAYROLL</u>
1. As of the Last Valuation Date		924	\$26,283
2. New Entrants		0	0
3. Total		924	26,283
4. Separations from Active Service			
a. Refund of Contributions	(9)		(199)
b. Separation with Deferred Annuity	(8)		NA
c. Separation with neither Refund nor Deferred Annuity	0		0
d. Disability	0		0
e. Death	0		0
f. Retirement with Service Annuity	(29)		NA
5. Total Separations	(46)		NA
6. Data Adjustments	5		755
7. As of Current Valuation Date	883		\$26,839
B. SERVICE RETIREMENT ANNUITANTS		<u>NUMBER</u>	<u>ANNUAL ANNUITY</u>
1. As of the Last Valuation Date		514	\$1,950
2. New Entrants		8	72
3. Total		522	2,022
4. Terminations			
a. Deaths	(18)		(61)
b. Others	0		0
5. Total Terminations	(18)		(61)
6. Data Adjustments	0		(29)
7. As of Current Valuation Date	504		\$1,932
C. DISABLED ANNUITANTS		<u>NUMBER</u>	<u>ANNUAL ANNUITY</u>
1. As of the Last Valuation Date		8	\$32
2. New Entrants		0	0
3. Total		8	32
4. Terminations			
a. Deaths	(1)		(6)
b. Others	0		0
5. Total Terminations	(1)		(6)
6. Data Adjustments	0		0
7. As of Current Valuation Date	7		\$26

TABLE 15A  
OLD  
(cont)

	<u>NUMBER</u>	<u>ANNUAL ANNUITY</u>
D. SURVIVING SPOUSE ANNUITANTS		
1. As of the Last Valuation Date	23	\$61
2. New Entrants	2	8
3. Total	25	69
4. Terminations		
a. Deaths	0	0
b. Others	0	0
5. Total Terminations	0	0
6. Data Adjustments	0	0
7. As of Current Valuation Date	25	\$69
E. SURVIVING CHILDREN ANNUITANTS		
1. As of the Last Valuation Date	0	\$0
2. New Entrants	0	0
3. Total	0	0
4. Terminations		
a. Deaths	0	0
b. Others	0	0
5. Total Terminations	0	0
6. Data Adjustments	0	0
7. As of Current Valuation Date	0	\$0
F. DEFERRED ANNUITANTS		
1. As of the Last Valuation Date	47	\$58
2. New Entrants	11	8
3. Total	58	66
4. Terminations		
a. Deaths	0	0
b. Others	(2)	(3)
5. Total Terminations	(2)	(3)
6. Data Adjustments	1	0
7. As of Current Valuation Date	57	\$63



# DULUTH TEACHERS' RETIREMENT FUND

NEW

## REPORT HIGHLIGHTS (DOLLARS IN THOUSANDS)

	<u>07/01/85 VALUATION</u>	<u>07/01/86 VALUATION</u>
<b>A. CONTRIBUTIONS (TABLE 11B)</b>		
1. Statutory Contributions - Chapter 354A % of Payroll	10.29%	10.29%
2. Required Contributions - Chapter 356 % of Payroll	8.98%	9.21%
3. Sufficiency (Deficiency) (A1-A2)	1.31%	1.08%
<b>B. FUNDING RATIOS</b>		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 2)	\$4,992	\$8,313
b. Current Benefit Obligations (Table 8B)	\$4,795	\$8,048
c. Funding Ratio (a/b)	104.11%	103.29%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 2)	\$4,992	\$8,313
b. Actuarial Accrued Liability (Table 9B)	\$4,860	\$8,123
c. Funding Ratio (a/b)	102.72%	102.34%
3. Projected Benefit Funding Ratio (Table 8B)		
a. Current and Expected Future Assets	\$10,040	\$16,005
b. Current and Expected Future Benefit Obligations	\$9,208	\$14,994
c. Funding Ratio (a/b)	109.04%	106.74%
<b>C. PLAN PARTICIPANTS</b>		
1. Active Members		
a. Number (Table 3B)	258	368
b. Projected Annual Earnings	\$3,231	\$4,913
c. Average Annual Earnings (Actual \$)	\$12,523	\$13,349
d. Average Age	34.6	35.9
e. Average Service	1.1	1.4
2. Others		
a. Service Retirements (Table 4B)	48	72
b. Disability Retirements (Table 5B)	0	0
c. Survivors (Table 6B)	0	0
d. Deferred Retirements (Table 7B)	3	1
e. Terminated Other Non-vested (Table 7B)	0	0
f. Total	51	73

# DULUTH TEACHERS' RETIREMENT FUND

TABLE 3B  
NEW

## ACTIVE MEMBERS AS OF JUNE 30, 1986

AGE	YEARS OF SERVICE								TOTAL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	2	4							6
25-29	11	25							36
30-34	94	67	1						162
35-39	21	57	3						81
40-44	8	28							36
45-49	7	17	1						25
50-54	5	10							15
55-59	1	5							6
60-64									0
65+	1								1
TOTAL	150	213	5	0	0	0	0	0	368

## AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE								ALL
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	
<25	10,019	14,990							13,333
25-29	5,144	15,958							12,654
30-34	4,895	15,685	23,902						9,475
35-39	6,689	17,453	18,852						14,714
40-44	8,988	20,188							17,699
45-49	4,714	20,517	24,585						16,255
50-54	5,267	21,630							16,176
55-59		12,611							10,509
60-64									0
65+	1,220								1,220
ALL	5,398	17,361	21,009	0	0	0	0	0	12,535

## 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
810	3,698	105	0	0	0	0	0	4,613

# DULUTH TEACHERS' RETIREMENT FUND

TABLE 4B  
NEW

## SERVICE RETIREMENTS AS OF JUNE 30, 1986

AGE	YEARS RETIRED							TOTAL
	<u>&lt;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	17	15						32
60-64	6	22						28
65-69	1	11						12
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	24	48	0	0	0	0	0	72

## AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED							ALL
	<u>&lt;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	8,644	6,551						7,663
60-64	8,951	7,783						8,034
65-69	10,926	6,693						7,046
70-74								0
75-79								0
80-84								0
85+								0
ALL	8,816	7,148	0	0	0	0	0	7,704

## TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

<u>&lt;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
212	343	0	0	0	0	0	555

# DULUTH TEACHERS' RETIREMENT FUND

TABLE 7B  
NEW

## RECONCILIATION OF MEMBERS

	<u>ACTIVES</u>	<u>TERMINATED</u>	
		<u>DEFERRED RETIREMENT</u>	<u>OTHER NON-VESTED</u>
A. On June 30, 1985	258	3	0
B. Additions	132	0	0
C. Deletions:			
1. Service Retirement	(2)	(1)	
2. Disability	0		
3. Death	0	0	
4. Terminated-Deferred	(3)		
5. Terminated-Refund	(19)	0	0
6. Terminated-Other Non-vested	0		
7. Returned as Active		0	0
D. Data Adjustments	2	(1)	0
	Vested 0		
	Non-Vested 368		
E. Total on June 30, 1986	368	1	0

	<u>RECIPIENTS</u>		
	<u>RETIREMENT ANNUITANTS</u>	<u>DISABLED</u>	<u>SURVIVORS</u>
A. On June 30, 1985	48	0	0
B. Additions	24	0	0
C. Deletions:			
1. Service Retirement		0	
2. Death	0	0	0
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	
D. Data Adjustments	0	0	0
E. Total on June 30, 1986	72	0	0

**DULUTH TEACHERS' RETIREMENT FUND**

**TABLE 8B  
NEW**

**ACTUARIAL BALANCE SHEET  
(DOLLARS IN THOUSANDS)**

**JULY 1, 1986**

<b>A. CURRENT ASSETS (TABLE 2, K3)</b>			<b>\$8,313</b>
<b>B. EXPECTED FUTURE ASSETS</b>			
1. Present Value of Expected Future Supplemental Contributions			821
2. Present Value of Future Normal Costs			6,871
			-----
3. Total Expected Future Assets			7,692
			-----
<b>C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS</b>			<b>\$16,005</b>
			=====
<b>D. CURRENT BENEFIT OBLIGATIONS</b>	<b><u>Non-Vested</u></b>	<b><u>Vested</u></b>	<b><u>Total</u></b>
1. Benefit Recipients			
a. Retirement Annuities		\$7,386	\$7,386
b. Disability Benefits		0	0
c. Surviving Spouse's Benefits		0	0
d. Surviving Children's Benefits		0	0
2. Deferred Retirements		1	1
3. Former Members without Vested Rights		0	0
4. Active Members			
a. Retirement Annuities	461	0	461
b. Disability Benefits	57	0	57
c. Survivors' Benefits	9	0	9
d. Deferred Retirements	5	0	5
e. Refund Liability Due to Death or Withdrawal	129	0	129
	-----	-----	-----
5. Total Current Benefit Obligations	\$661	\$7,387	\$8,048
	-----	-----	-----
<b>E. EXPECTED FUTURE BENEFIT OBLIGATIONS</b>			<b>\$6,946</b>
			-----
<b>F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS</b>			<b>\$14,994</b>
			=====
<b>G. CURRENT UNFUNDED LIABILITY (D5-A)</b>			<b>(\$265)</b>
<b>H. CURRENT AND FUTURE UNFUNDED LIABILITY (F-C)</b>			<b>(\$1,011)</b>

TABLE 9B  
NEW

## DULUTH TEACHERS' RETIREMENT FUND

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

JULY 1, 1986

	ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS <u>(1)</u>	ACTUARIAL PRESENT VALUE OF FUTURE NORMAL COSTS <u>(2)</u>	ACTUARIAL ACCRUED LIABILITY <u>(3)=(1)-(2)</u>
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	\$6,318	\$5,692	\$626
b. Disability Benefits	568	513	55
c. Survivors Benefits	125	114	11
d. Deferred Retirements	53	48	5
e. Refunds Due to Death or Withdrawal	543	504	39
	-----	-----	-----
f. Total	\$7,607	\$6,871	\$736
	-----	-----	-----
2. Deferred Retirements	\$1		\$1
3. Former Members Without Vested Rights	0		0
4. Annuitants in MPRIF	0		0
5. Recipients Not in MPRIF	7,386		7,386
	-----	-----	-----
6. Total AAL	\$14,994	\$6,871	\$8,123
	=====	=====	=====
B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)			
1. AAL (A6)			\$8,123
2. Current Assets (Table 2, K3)			8,313
			-----
3. UAAL (B1-B2)			(\$190)
			=====
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE			
1. Present Value of Future Payrolls to the Amortization Date of July 1, 2009			\$93,320
2. Supplemental Contribution Rate (B3/C1)			-0.20%

## DULUTH TEACHERS' RETIREMENT FUND

CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)  
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1986

A. UAAL AT BEGINNING OF YEAR	(\$132)
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	\$453
2. Contribution	(500)
3. Interest on A, B1, and B2	(12)
	-----
4. Total (B1+B2+B3)	(\$59)
	-----
C. EXPECTED UAAL AT END OF YEAR (A+B4)	(\$191)
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	\$1
2. Investment Return	(624)
3. MPRIF Mortality	0
4. Mortality of Other Benefit Recipients	43
5. Other Items	581
	-----
6. Total	\$1
	-----
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	(\$190)
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	\$0
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	\$0
	-----
H. UAAL AT END OF YEAR (E+F+G)	(\$190)
	=====

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

TABLE 11B  
NEW

JULY 1, 1986

	<u>% OF PAYROLL</u>	<u>\$ AMOUNT</u>
<b>A. STATUTORY CONTRIBUTIONS - CHAPTER 354A</b>		
1. Employee Contributions	4.50%	\$221
2. Employer Contributions	5.79%	284
	-----	-----
3. Total	10.29%	\$505
	=====	=====
<b>B. REQUIRED CONTRIBUTIONS - CHAPTER 356</b>		
1. Normal Cost		
a. Retirement Benefits	7.17%	\$352
b. Disability Benefits	0.63%	31
c. Survivors	0.14%	7
d. Deferred Retirement Benefits	0.06%	3
e. Refunds Due to Death or Withdrawal	0.63%	31
	-----	-----
f. Total	8.63%	\$424
	-----	-----
2. Supplemental Contribution Amortization by July 1, 2009 of UAAL of \$(190)	-0.20%	(\$10)
3. Allowance for Expenses	0.78%	\$38
	-----	-----
4. Total	9.21%	\$452
<b>C. CONTRIBUTION SUFFICIENCY (DEFICIENCY)</b>		
(A3-B4)	1.08%	\$53

Note: Projected Annual Payroll for Fiscal Year Beginning  
on July 1, 1986 is \$4,913



# DULUTH TEACHERS' RETIREMENT FUND

TABLE 12B  
NEW

## PROJECTED CASH FLOW JULY 1, 1986

<u>FISCAL YEAR</u>	<u>STATUTORY CONTRIBUTIONS</u>	<u>TRANSFERS FROM OLD PLAN</u>	<u>OTHER DISBURSEMENTS</u>	<u>INVESTMENT RETURN</u>	<u>CURRENT ASSETS YEAR END</u>
1986					\$8,313
1987	\$505	\$1,824	\$1,088	\$715	10,269
1988	751	203	1,077	817	10,963
1989	913	72	1,054	874	11,768
1990	1,097	322	1,066	956	13,077
1991	1,333	78	1,046	1,061	14,503
1992	1,553	715	1,106	1,207	16,872
1993	1,843	1,660	1,279	1,439	20,535
1994	2,211	2,175	1,531	1,757	25,147
1995	2,566	1,968	1,783	2,122	30,020
1996	2,961	3,326	2,169	2,566	36,704
1997	3,464	5,386	2,775	3,179	45,958
1998	3,939	3,890	3,262	3,859	54,384
1999	4,485	4,645	3,809	4,564	64,269
2000	4,997	3,353	4,245	5,306	73,680
2001	5,574	5,581	4,965	6,142	86,012
2002	6,199	5,034	5,600	7,106	98,751
2003	6,905	8,485	6,584	8,252	115,809
2004	7,620	7,459	7,524	9,567	132,931
2005	8,402	6,321	8,303	10,891	150,242
2006	9,271	9,590	9,512	12,393	171,984
2007	10,305	13,828	11,155	14,278	199,240
2008	11,353	13,354	12,808	16,415	227,554
2009	12,382	9,799	14,154	18,525	254,106
2010	13,455	9,466	15,392	20,630	282,265
2011	14,669	10,929	17,074	22,922	313,711

**DULUTH TEACHERS' RETIREMENT FUND****TABLE 14B  
NEW****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 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	4.5% 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.
<b>RETIREMENT</b>	
<b>Normal Retirement Benefit</b>	
Eligibility	Age 65 and 10 years of Allowable Service. Age 62 and 30 years of Allowable Service. Rule of 85: Age 55 and age plus Allowable Service totals 85 prior to 1/1/87, and retirement prior to 7/1/87.
Amount	1% of Average Salary for the first 10 years of Allowable Service and 1.5% of Average Salary for each subsequent year.
<b>Early Retirement Benefit</b>	
Eligibility	Age 55 and 10 years of Allowable Service. Any age with 30 years of Allowable Service.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date with reduction of 0.5% for each month the Member is under age 65 at time of retirement (age 62 if 30 years of Allowable Service). The reduction factor of 0.5% is replaced by 0.25% for each month the Member is under age 60.

TABLE 14B  
NEW  
(cont)

Form of Payment	Life annuity. Actuarially equivalent options are: 5, 10, 15, or 20 year certain and life 50% or 100% joint and survivor 50% or 100% bounce back joint and survivor (option is cancelled if Member is pre-deceased by beneficiary). Guaranteed refund A larger life annuity before age 62 and reduced thereafter.
Benefit Increases	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.
<b>DISABILITY</b> Disability Benefit Eligibility	Totally and permanently disabled under age 65 and is age 50 or older with 5 years of Allowable Service or younger than age 50 with 10 years of Allowable Service. Also the last 5 years must have been uninterrupted.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at disability without reduction for commencement before age 65. Benefit is reduced by Workers' Compensation.  Payment may begin 90 days after disability and stops at age 65 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 Benefits Eligibility	Age 65 if still totally and permanently disabled.
Amount	Optional annuity continues. Otherwise the larger of the disability benefit paid before age 65 or the normal retirement benefit available at age 65, or an actuarially equivalent optional annuity.

**TABLE 14B**  
**NEW**  
**(cont)**

Benefit Increases      Same as for retirement.

**DEATH BENEFITS**

Surviving Spouse Optional  
Annuity

Eligibility      Member who dies before retirement benefits commence if age 50 with 20 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. (Amended 1986)

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 of the person on whose behalf the annuity is paid and the years receiving payment.

Refund of Member's Contri-  
butions With Interest

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.

**TERMINATION BENEFITS**

Refund of Member's Contri-  
butions

Eligibility      Termination of teaching service.

Amount      Member's contributions with 5% interest. A deferred annuity may be elected in lieu of a refund.

Deferred Annuity  
Eligibility

10 years of Allowable Service.

Amount      Benefit computed under law in effect at termination. Amount is payable as a normal or early retirement.

# DULUTH TEACHERS' RETIREMENT FUND

TABLE 15B  
NEW

## MEMBERSHIP CHANGES (DOLLARS IN THOUSANDS)

JUNE 30, 1986

		<u>NUMBER</u>	<u>PAYROLL</u>
<b>A. ACTIVE MEMBERS</b>			
1. As of the Last Valuation Date		258	\$3,034
2. New Entrants		132	1,494
3. Total		390	4,528
4. Separations from Active Service			
a. Refund of Contributions	(19)		(131)
b. Separation with Deferred Annuity	(3)		NA
c. Separation with neither Refund nor Deferred Annuity	0		0
d. Disability	0		0
e. Death	0		0
f. Retirement with Service Annuity	(2)		NA
5. Total Separations	(24)		NA
6. Data Adjustments	2		216
7. As of Current Valuation Date	368		\$4,613
<b>B. SERVICE RETIREMENT ANNUITANTS</b>		<u>NUMBER</u>	<u>ANNUAL ANNUITY</u>
1. As of the Last Valuation Date		48	\$323
2. New Entrants		24	232
3. Total		72	555
4. Terminations			
a. Deaths	0		0
b. Others	0		0
5. Total Terminations	0		0
6. Data Adjustments	0		0
7. As of Current Valuation Date	72		\$555
<b>C. DISABLED ANNUITANTS</b>		<u>NUMBER</u>	<u>ANNUAL ANNUITY</u>
1. As of the Last Valuation Date		0	\$0
2. New Entrants		0	0
3. Total		0	0
4. Terminations			
a. Deaths	0		0
b. Others	0		0
5. Total Terminations	0		0
6. Data Adjustments	0		0
7. As of Current Valuation Date	0		\$0

TABLE 15B  
NEW  
(cont)

	<u>NUMBER</u>	<u>ANNUAL ANNUITY</u>
D. SURVIVING SPOUSE ANNUITANTS		
1. As of the Last Valuation Date	0	\$0
2. New Entrants	0	0
3. Total	0	0
4. Terminations	0	0
a. Deaths	0	0
b. Others	0	0
5. Total Terminations	0	0
6. Data Adjustments	0	0
7. As of Current Valuation Date	0	\$0
E. SURVIVING CHILDREN ANNUITANTS		
1. As of the Last Valuation Date	0	\$0
2. New Entrants	0	0
3. Total	0	0
4. Terminations	0	0
a. Deaths	0	0
b. Others	0	0
5. Total Terminations	0	0
6. Data Adjustments	0	0
7. As of Current Valuation Date	0	\$0
F. DEFERRED ANNUITANTS		
1. As of the Last Valuation Date	3	\$1
2. New Entrants	0	0
3. Total	3	1
4. Terminations	0	0
a. Deaths	(1)	(1)
b. Others	(1)	(1)
5. Total Terminations	(1)	0
6. Data Adjustments	(1)	0
7. As of Current Valuation Date	1	\$0