MEMORANDUM

TO: Legislative Commission on Pensions and Retirement

FROM: Robert E. Perkins and Michael C. Gunvalson

DATE: April 12, 1989

SUBJ: Recommendations of Commission Actuary

Our 1988 actuarial valuation reports show that four funds have required contributions that exceed statutory contributions. We recommend that the statutory contributions be increased to the required contribution level for each of the four funds.

Since these four funds vary considerably in the amount of their contribution deficiency, we recommend that the Commission resolve the deficiency problems in the following priority:

1. Minneapolis Teachers Retirement Fund
2. St. Paul Teachers Retirement Fund
3. Public Employees Retirement Fund
4. Duluth Teachers Retirement Fund

The purpose of this memorandum is to describe the current situation and provide reasons for adopting the recommendations. Attached to this memorandum are four tables displaying the results of our actuarial valuations for the past four years. In addition, there is a graph showing the projection of current assets (i.e., market plus 1/3 of the difference between cost and market) for the three first class city teacher funds over the next 25 years.

Current Situation

1. Each of these four funds provide basic and coordinated benefits or, in the case of Duluth Teachers, old plan and new plan benefits. In all plans except for Duluth Teachers, the statutory contribution level is much higher for the basic plan members than for the coordinated plan members.

   The attached tables show the statutory contributions over the past four years based on the combination of basic and coordinated member contributions. These statutory contributions decrease each year, except for Duluth Teachers, because of the shift in the membership population from basic plan to coordinated plan. This shift is taking place because the basic benefit is restricted to a closed group, and the coordinated benefit is provided to all new members.

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2. The required contribution is calculated by the Commission actuary in accordance with Chapter 356 of Minnesota Statutes. This required contribution is the sum of the normal cost, the supplemental contribution and a contribution to cover expenses.

During the period 1985 through 1988, the required contribution has been affected by the following events:

The shift in emphasis from basic to coordinated benefits.

Benefit changes such as the reduction in eligibility for vesting.

Actuarial gains and losses, especially those arising from investments.

A new mortality table, in the case of PERA.

3. A contribution deficiency is produced each year that the required contribution exceeds the statutory contribution.

Minneapolis Teachers has had four consecutive years of deficiencies in excess of 10% of payroll. The 1988 deficiency is 11.33% of payroll, or $12.9 million.

The St. Paul Teachers has also had four years of deficiencies; however, at a much lower level. The 1988 deficiency is 4.50% of payroll, which equates to $4.3 million.

The Public Employees Retirement Fund shows a deficiency in 1988 for the first time in four years. This deficiency is only .48% of payroll, but due to the large number of members, it is equal to $8.5 million. This deficiency occurred when PERA elected to strengthen their mortality assumption by assuming a longer life expectancy. As a result, higher liabilities are reported for 1988.

The Duluth Teachers Retirement Fund has also had four years of contribution deficiencies. However, we believe these deficiencies are less critical than the other three because of the high funding ratio determined for the Duluth plan.

4. Only Minneapolis Teachers has achieved an improvement in funding ratio in each of the past four years. However, their funding ratio is only 54.1%, which is considerably lower than the other three funds.

Just as St. Paul Teachers shows the second highest deficiency in contribution, they also show the second lowest funded ratio at 60.2%.

The funding ratio for PERA has remained in the 70's, which is consistent with the ratios reported by the other two state-wide funds.

As noted earlier, the Duluth Teachers Retirement Fund shows a relatively high funding ratio which has exceeded 80% over three of the past four years.

Discussion

1. We believe the seriousness of the Minneapolis Teachers contribution deficiency and low funded ratio can best be demonstrated by a 25 year projection of assets. The attached graph shows a projection comparing Minneapolis Teachers to St. Paul Teachers and Duluth Teachers. The projection shows increasing asset values until the year 2002, at which time assets begin to diminish in value and quickly reduce to a fund of under $100 million (in 1989 dollars) by the year 2013.

2. The Minneapolis Teachers Plan adopted a provision in 1987 which permits an increase in permanent benefits based on investment returns in excess of 8%. To the extent those investment gains are used to provide additional benefits, those gains will not be available to help reduce the unfunded actuarial accrued liability at that time.

   St. Paul Teachers and Duluth Teachers are entitled to pay out up to 1% of excess earnings if their fund's investment returns exceed 6%. Our valuations assume the full 1% is paid out each year. To the extent a smaller amount is paid, any excess investment gains can be used to reduce the then unfunded actuarial accrued liability.

3. Minnesota Statutes require that the unfunded actuarial accrued liability be funded as a level percentage of pay by a set date in the future (2009 in the case of the Minneapolis Teachers Retirement Fund). Large contribution deficiencies, such as those experienced by Minneapolis Teachers, are detrimental to the amortization of the unfunded actuarial accrued liability. If the unfunded actuarial accrued liability is not reduced in an orderly fashion, the amortization portion of the required contribution (i.e., the supplemental contribution) will become an increasing burden in future years. This supplemental contribution has increased in each of the four years beginning with 14.22% in 1985 to its current level of 15.28% in 1988.

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Robert E. Perlin
Michael C. Gunvalson

Table 1

Minneapolis Teachers' Retirement Fund

	Current Statutory Contribution Basic	Coordinated
Employee	8.50%	4.50%
Employer	13.35	4.50
Total	21.85%	9.00%

	1985	1986	1987	1988
Statutory Contributions				
Employee	7.93%	7.81%	7.60%	7.44%
Employer	12.06	11.83	11.36	10.99
Total	19.99%	19.64%	18.96%	18.43%
Required Contributions				
Normal Cost	16.28%	16.22%	13.33%	13.25%
Supplemental Contribution	14.22	14.41	14.62	15.28
Expenses	1.28	1.39	1.39	1.23
Total	31.78%	32.02%	29.34%	29.76%
Sufficiency (Deficiency)				
%	(11.79)%	(12.38)%	(10.38)%	(11.33)%
Millions of Dollars	$(10.3)M	$(12.1)M	$(11.3)M	$(12.9)M
Accrued Liability Funding Ratios				
%	49.3%	50.8%	53.7%	54.1%

Table 2

St. Paul Teachers' Retirement Fund

	Current Statutory Contribution Basic	Coordinated
Employee	8.00%	4.50%
Employer	12.63	4.50
Total	20.63%	9.00%

	1985	1986	1987	1988
Statutory Contributions				
Employee	7.12%	6.96%	6.83%	6.71%
Employer	10.59	10.22	9.91	9.63
Total	17.71%	17.18%	16.74%	16.34%
Required Contributions				
Normal Cost	11.74%	11.42%	11.56%	11.36%
Supplemental Contribution	9.87	8.97	8.37	8.95
Expenses	0.34	0.38	0.46	0.53
Total	21.95%	20.77%	20.39%	20.84%
Sufficiency (Deficiency)				
%	(4.24)%	(3.59)%	(3.65)%	(4.50)%
Millions of Dollars	$(3.2)M	$(3.0)M	$(3.3)M	$(4.3)M
Accrued Liability Funding Ratios				
%	52.0%	57.1%	61.3%	60.2%

Table 3

Public Employees' Retirement Fund

	Current Statutory Contribution	
	Basic	Coordinated
Employee	8.00%	4.00%
Employer	10.50	4.25
Total	18.50%	8.25%

	1985	1986	1987	1988
Statutory Contributions				
Employee	4.43%	4.37%	4.31%	4.27%
Employer	4.93	4.83	4.74	4.67
Total	9.36%	9.20%	9.05%	8.94%
Required Contributions				
Normal Cost	5.67%	5.59%	5.45%	5.72%
Supplemental Contribution	2.75	2.64	2.43	3.40
Expenses	0.35	0.32	0.33	0.30
Total	8.77%	8.55%	8.21%	9.42%
Sufficiency (Deficiency)				
%	0.59%	0.65%	0.84%	(0.48)%
Millions of Dollars	$124.9M	$10.1M	$13.8M	$(8.5)M
Accrued Liability Funding Ratios				
%	70.5%	73.4%	77.1%	70.8%

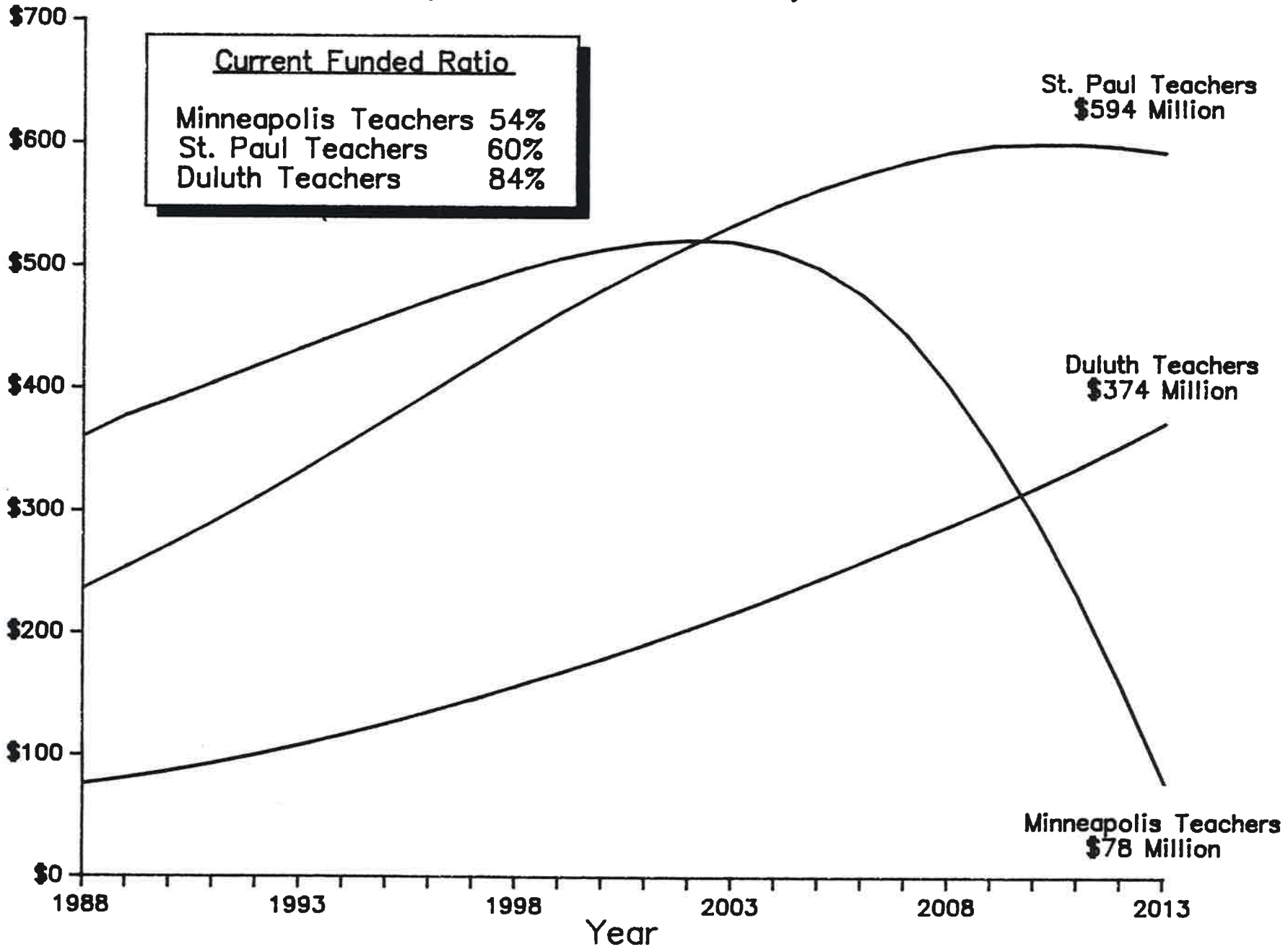
Table 4

Duluth Teachers' Retirement Fund

	Current Statutory Contribution	
	Old	New
Employee	4.50%	4.50%
Employer	5.79	5.79
Total	10.29%	10.29%

	1985	1986	1987	1988
Statutory Contributions				
Employee	4.50%	4.50%	4.50%	4.50%
Employer	5.79	5.79	5.79	5.79
Total	10.29%	10.29%	10.29%	10.29%
Required Contributions				
Normal Cost	8.03%	8.14%	8.11%	8.16%
Supplemental Contribution	2.81	2.10	1.55	2.13
Expenses	0.71	0.78	0.73	0.89
Total	11.55%	11.02%	10.39%	11.18%
Sufficiency (Deficiency)				
%	(1.27)%	(0.73)%	(0.10)%	(0.89)%
Millions of Dollars	$(0.4)M	$(0.2)M	$(0.0)M	$(0.3)M
Accrued Liability Funding Ratios				
%	75.7%	82.9%	87.9%	84.1%

Projection of Current Assets
(Millions of Dollars)



FIRST CLASS CITY TEACHERS RETIREMENT FUNDS
COMPARISON OF FACTORS

	TRA	Minneapolis Teachers		Duluth Teachers		St. Paul Teachers	
	FACTORS	FACTORS	% CHANGE TO TRA	FACTORS	% CHANGE TO TRA	FACTORS	% CHANGE TO TRA
1. Early Retirement							
Age 60	0.7887	0.7461	5.7%	0.7778	1.4%	0.7485	5.4%
Age 55	0.6436	0.5849	10.0%	0.6303	2.1%	0.5892	9.2%
2. 100% Joint and Survivor							
55/55	0.8898	0.8832	0.7%	0.8642	3.0%	0.8320	6.9%
60/60	0.8692	0.8650	0.5%	0.8423	3.2%	0.8061	7.8%
65/65	0.8451	0.8441	0.1%	0.8193	3.1%	0.7772	8.7%
65/60	0.8114	0.8020	1.2%	0.7742	4.8%	0.7227	12.3%
60/65	0.8984	0.8964	0.2%	0.8786	2.3%	0.8516	5.5%
60/55	0.8415	0.8320	1.1%	0.8052	4.5%	0.7622	10.4%
65/55	0.7773	0.7626	1.9%	0.7311	6.3%	0.6745	15.2%
55/65	0.9354	0.9347	0.1%	0.9210	1.6%	0.9030	3.6%
2. 50% Joint and Survivor							
55/55	0.9417	0.9381	0.4%	0.9272	1.6%	0.9083	3.7%
60/60	0.9301	0.9262	0.4%	0.9144	1.7%	0.8927	4.2%
65/65	0.9161	0.9157	0.0%	0.9007	1.7%	0.8746	4.7%
65/60	0.8959	0.8904	0.6%	0.8727	2.7%	0.8391	6.8%
60/65	0.9465	0.9466	-0.0%	0.9353	1.2%	0.9199	2.9%
60/55	0.9138	0.9074	0.7%	0.8921	2.4%	0.8651	5.6%
65/55	0.8747	0.8652	1.1%	0.8447	3.6%	0.8056	8.6%
55/65	0.9666	0.9656	0.1%	0.9589	0.8%	0.9490	1.9%

Mortality Tables:				
Factors - Early Retirement:	GA-71 (-8)	GA-71 Proj. D to 1975 (-2)	GA-71 Female	GA-83
- Options:	GA-71 (-8)	GA-51 Proj. C to 1970 (-5)	GA-71 Female	GA-65
Valuation - Males:	GA-71 (-8)	GA-71 Proj. D to 1975 (-2)	GA-71 Female	GA-83
- Females:	GA-71 (-8)	GA-71 Proj. D to 1975 (-8)	GA-71 Female	GA-83 (+1)

ST. PAUL TEACHERS' RETIREMENT FUND
ANNUITANT AND SURVIVOR MORTALITY

	1985 - 1986			1986 - 1987			1987 - 1988			1985 - 1988		
	ACTUAL DEATHS	EXPECTED DEATHS	ACTUAL/ EXPECTED	ACTUAL DEATHS	EXPECTED DEATHS	ACTUAL/ EXPECTED	ACTUAL DEATHS	EXPECTED DEATHS	ACTUAL/ EXPECTED	ACTUAL DEATHS	EXPECTED DEATHS	ACTUAL/ EXPECTED
1. St. Paul Mortality Table: Males - 1983 Group Annuity Mortality Table Females - 1983 Group Annuity Mortality Table set forward 1 year												
< 55	0	0.0	NA	0	0.0	NA	0	0.0	NA	0	0.0	NA
55-59	1	0.2	500%	0	0.3	0%	0	0.4	0%	1	0.9	111%
60-64	1	1.5	67%	2	1.6	125%	0	1.8	0%	3	4.9	61%
65-69	2	2.5	80%	4	2.9	138%	1	3.2	31%	7	8.6	81%
70-74	4	4.3	93%	4	4.2	95%	3	4.0	75%	11	12.5	88%
75-79	4	5.8	69%	6	6.2	97%	8	6.5	123%	18	18.5	97%
80-84	5	10.0	50%	11	10.3	107%	7	9.4	74%	23	29.7	77%
85-89	7	8.9	79%	6	9.5	63%	9	10.8	83%	22	29.2	75%
90-94	11	8.2	134%	12	7.4	162%	7	5.3	132%	30	20.9	144%
95+	4	4.3	93%	6	4.7	128%	12	6.1	197%	22	15.1	146%
TOTAL	39	45.7	85%	51	47.1	108%	47	47.5	99%	137	140.3	98%
AGES 65-84	15	22.6	66%	25	23.6	106%	19	23.1	82%	59	69.3	85%
2. TRA Mortality Table: Males - 1971 Group Annuity Mortality Table male rates set back 8 years Females - 1971 Group Annuity Mortality Table male rates set back 8 years												
< 55	0	0.0	NA	0	0.0	NA	0	0.0	NA	0	0.0	NA
55-59	1	0.2	500%	0	0.2	0%	0	0.3	0%	1	0.7	143%
60-64	1	1.3	77%	2	1.3	154%	0	1.6	0%	3	4.2	71%
65-69	2	2.2	91%	4	2.5	160%	1	2.7	37%	7	7.4	95%
70-74	4	3.6	111%	4	3.4	118%	3	3.3	91%	11	10.3	107%
75-79	4	5.0	80%	6	5.1	118%	8	5.3	151%	18	15.4	117%
80-84	5	8.3	60%	11	8.5	129%	7	7.8	90%	23	24.6	93%
85-89	7	7.4	95%	6	7.9	76%	9	8.8	102%	22	24.1	91%
90-94	11	6.7	164%	12	6.0	200%	7	4.4	159%	30	17.1	175%
95+	4	2.9	138%	6	3.1	194%	12	4.1	293%	22	10.1	218%
TOTAL	39	37.6	104%	51	38.0	134%	47	38.3	123%	137	113.9	120%
AGES 65-84	15	19.1	79%	25	19.5	128%	19	19.1	99%	59	57.7	102%

MINNEAPOLIS TEACHERS' RETIREMENT FUND
ANNUITANT AND SURVIVOR MORTALITY

	1985 - 1986			1986 - 1987			1987 - 1988			1985 - 1988		
	ACTUAL DEATHS	EXPECTED DEATHS	ACTUAL/ EXPECTED	ACTUAL DEATHS	EXPECTED DEATHS	ACTUAL/ EXPECTED	ACTUAL DEATHS	EXPECTED DEATHS	ACTUAL/ EXPECTED	ACTUAL DEATHS	EXPECTED DEATHS	ACTUAL/ EXPECTED
1. Minneapolis Teachers' Mortality: Males - 1971 Group Annuity Mortality Table projected to 1975 by Scale D set back two years Females - 1971 Group Annuity Mortality Table projected to 1975 by Scale D set back eight years												
< 55	0	0.1	0%	0	0.3	0%	1	0.2	500%	1	0.6	167%
55-59	1	0.8	125%	1	0.9	111%	1	0.8	125%	3	2.5	120%
60-64	3	3.2	94%	2	3.1	65%	3	3.1	97%	8	9.4	85%
65-69	0	5.4	0%	4	6.0	67%	3	6.0	50%	7	17.4	40%
70-74	6	7.9	76%	4	7.9	51%	11	8.4	131%	21	24.2	87%
75-79	8	15.5	52%	11	13.5	81%	13	12.6	103%	32	41.6	77%
80-84	13	21.8	60%	17	21.1	81%	30	20.2	149%	60	63.1	95%
85-89	22	16.6	133%	16	16.9	95%	13	17.8	73%	51	51.3	99%
90-94	17	13.3	128%	18	14.9	121%	18	15.4	117%	53	43.6	122%
95+	11	8.3	133%	19	8.4	226%	13	7.9	165%	43	24.6	175%
TOTAL	81	92.9	87%	92	93.0	99%	106	92.4	115%	279	278.3	100%
AGES 65-84	27	50.6	53%	36	48.5	74%	57	47.2	121%	120	146.3	82%
2. TRA Mortality Table: Males - 1971 Group Annuity Mortality Table male rates set back 8 years Females - 1971 Group Annuity Mortality Table male rates set back 8 years												
< 55	0	0.1	0%	0	0.3	0%	1	0.2	500%	1	0.6	167%
55-59	1	0.5	200%	1	0.6	167%	1	0.5	200%	3	1.6	188%
60-64	3	2.3	130%	2	2.2	91%	3	2.2	136%	8	6.7	119%
65-69	0	4.2	0%	4	4.7	85%	3	4.6	65%	7	13.5	52%
70-74	6	6.8	88%	4	6.7	60%	11	7.0	157%	21	20.5	102%
75-79	8	13.5	59%	11	12.0	92%	13	11.1	117%	32	36.6	87%
80-84	13	19.2	68%	17	19.2	89%	30	18.5	162%	60	56.9	105%
85-89	22	15.6	141%	16	15.8	101%	13	16.6	78%	51	48.0	106%
90-94	17	12.7	134%	18	14.1	128%	18	14.6	123%	53	41.4	128%
95+	11	8.1	136%	19	8.2	232%	13	7.7	169%	43	24.0	179%
TOTAL	81	83.0	98%	92	83.8	110%	106	83.0	128%	279	249.8	112%
AGES 65-84	27	43.7	62%	36	42.6	85%	57	41.2	138%	120	127.5	94%

DULUTH TEACHERS' RETIREMENT FUND
ANNUITANT AND SURVIVOR MORTALITY

	1985 - 1986			1986 - 1987			1987 - 1988			1985 - 1988		
	ACTUAL DEATHS	EXPECTED DEATHS	ACTUAL/ EXPECTED	ACTUAL DEATHS	EXPECTED DEATHS	ACTUAL/ EXPECTED	ACTUAL DEATHS	EXPECTED DEATHS	ACTUAL/ EXPECTED	ACTUAL DEATHS	EXPECTED DEATHS	ACTUAL/ EXPECTED
1. Duluth Mortality Table: Male - 1971 Group Annuity Mortality Table female rates Female - 1971 Group Annuity Mortality Table female rates												
< 55	0	0.0	NA	1	0.0	NA	1	0.0	NA	2	0.0	NA
55-59	0	0.2	0%	0	0.2	0%	2	0.3	667%	2	0.7	286%
60-64	1	0.6	167%	2	0.6	333%	1	0.9	111%	4	2.1	190%
65-69	1	1.3	77%	1	1.3	77%	2	1.3	154%	4	3.9	103%
70-74	2	2.0	100%	0	2.1	0%	0	2.1	0%	2	6.2	32%
75-79	3	4.5	67%	2	4.4	45%	3	4.2	71%	8	13.1	61%
80-84	5	5.1	98%	4	5.1	78%	5	5.6	89%	14	15.8	89%
85-89	2	5.5	36%	4	5.1	78%	4	5.0	80%	10	15.6	64%
90-94	1	4.0	25%	2	4.4	45%	7	4.7	149%	10	13.1	76%
95+	3	2.8	107%	1	3.2	31%	0	3.5	0%	4	9.5	42%
TOTAL	18	26.0	69%	17	26.4	64%	25	27.6	91%	60	80.0	75%
AGES 65-84	11	12.9	85%	7	12.9	54%	10	13.2	76%	28	39.0	72%
2. TRA Mortality Table: Males - 1971 Group Annuity Mortality Table male rates set back 8 years Females - 1971 Group Annuity Mortality Table male rates set back 8 years												
< 55	0	0.0	NA	1	0.0	NA	1	0.0	NA	2	0.0	NA
55-59	0	0.2	0%	0	0.2	0%	2	0.3	667%	2	0.7	286%
60-64	1	0.8	125%	2	0.8	250%	1	1.1	91%	4	2.7	148%
65-69	1	1.3	77%	1	1.3	77%	2	1.3	154%	4	3.9	103%
70-74	2	1.7	118%	0	1.8	0%	0	1.8	0%	2	5.3	38%
75-79	3	3.6	83%	2	3.6	56%	3	3.4	88%	8	10.6	75%
80-84	5	3.9	128%	4	3.9	103%	5	4.2	119%	14	12.0	117%
85-89	2	4.1	49%	4	3.7	108%	4	3.8	105%	10	11.6	86%
90-94	1	2.9	34%	2	3.1	65%	7	3.4	206%	10	9.4	106%
95+	3	1.8	167%	1	2.1	48%	0	2.4	0%	4	6.3	63%
TOTAL	18	20.3	89%	17	20.5	83%	25	21.7	115%	60	62.5	96%
AGES 65-84	11	10.5	105%	7	10.6	66%	10	10.7	93%	28	31.8	88%