

Report of
AN EXPERIENCE STUDY
Covering 1975-1978
CITY OF RICHFIELD
FIRE DEPARTMENT RELIEF ASSOCIATION
Richfield, Minnesota

November 30, 1979

Fire Department Relief Association

Richfield, Minnesota

Submitted in this report are the results of an experience study, covering experiences of persons covered by the Pension Plan during calendar years 1975-1978.

The covered person data necessary for an experience study was furnished by the Plan.

The financial assumptions which produce "Expected" experiences are summarized on pages 9-11. These are the assumptions used in the December 31, 1978 actuarial valuation, which was reported earlier this year.

Result pages 3-8 will probably be of particular interest.

Experience Study Report in 1980. The basic relationship planned between Actuarial Valuations and Actuarial Investigations is that each be done in alternate calendar years.

Valuations are reported in 1979, 1981, and so on.

Investigations are reported in 1980, 1982, and so on.

The 1980 Actuarial Investigation Report will be more comprehensive, and will cover experiences for the calendar year 1979 as well as the years covered in this report. In addition, recommendations will be made for revised financial assumptions, based upon the investigation findings.

Respectfully submitted,

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In making monetary calculations for a retirement plan, assumptions must be made for future experiences in a variety of risk areas.

FINANCIAL RISK AREAS

Present In a Retirement Plan

Type of Risk Area

Withdrawals from Employment. If more liabilities are released by withdrawals than assumed, there is a gain to the plan. If smaller releases, a loss.

Deaths of Active Members. If survivor claims are less than assumed, there is a gain to the plan. If more claims, a loss.

Disability Retirements. If disability claims are less than assumed, there is a gain to the plan. If more claims, a loss.

Age & Service Retirements. If members retire at older ages than assumed, there is a gain to the plan. If younger ages, a loss.

Pay Increases. If there are smaller pay increases than assumed, there is a gain to the plan. If greater pay increases, a loss.

Investment Return. If there is greater investment return than assumed, there is a gain to the plan. If less investment return, a loss.

Death After Retirement. If retired lives live longer than assumed, there is a loss to the plan. If shorter lives, a gain.

Actual financial experience will not coincide exactly with assumed financial experience. The future cannot be predicted with 100% precision.

An actuarial investigation reveals the difference between actual and assumed experience in each risk area. Once a difference has been observed to be sizeable and persistent, the assumed experience should be changed to reflect the observed reality.

SCHEDULE 1.

RICHFIELD FIREMEN'S RELIEF ASSOCIATION
WITHDRAWAL OF ACTIVE MEMBERS WITHOUT VESTED BENEFITS

ACTUAL & EXPECTED

ATTAINED AGES	NUMBER OF ACTUAL EVENTS				CALENDAR YEARS 1975-1978		
	-----				EXPOSED TO RISK *	NUMBER OF EVENTS	
	1975	1976	1977	1978		EXPECTED	ACTUAL
-----	-----	-----	-----	-----	-----	-----	-----
20-24	0	0	0	0	1	0.03	0
25-29	0	0	0	0	7	0.14	0
30-34	0	0	0	0	9	0.18	0
35-39	0	1	0	0	14	0.18	1
40-44	0	0	0	1	25	0.25	1
45-49	0	0	0	0	16	0.04	0
50-54	0	0	0	0	15	0.00	0
55-59	0	0	0	0	1	0.00	0
60+	0	0	0	0	1	0.00	0
	--	--	--	--	---	----	--
TOTALS	0	1	0	1	89	0.82	2

* AN "EXPOSED TO RISK" OF "1" MEANS ONE PERSON EXPOSED DURING ONE YEAR TO THE RISK BEING OBSERVED. A PERSON EXPOSED DURING EACH OF THE 4 YEARS APPEARS IN THIS COLUMN 4 TIMES.

IF MORE LIABILITIES ARE RELEASED BY WITHDRAWALS THAN EXPECTED, THERE WILL BE A GAIN TO THE PLAN. IF SMALLER RELEASES, A LOSS.

SCHEDULE 2.

RICHFIELD FIREMEN'S RELIEF ASSOCIATION

DEATHS OF ACTIVE MEMBERS

ACTUAL & EXPECTED

ATTAINED AGES -----	NUMBER OF ACTUAL EVENTS				CALENDAR YEARS 1975-1978		
	-----				EXPOSED TO RISK *	NUMBER OF EVENTS	
	1975	1976	1977	1978		EXPECTED	ACTUAL
-----	-----	-----	-----	-----	-----	-----	-----
20-24	0	0	0	0	1	0.0017	0
25-29	0	0	0	0	7	0.0105	0
30-34	0	0	0	0	9	0.0155	0
35-39	0	0	0	0	14	0.0331	0
40-44	0	0	0	0	25	0.1084	0
45-49	0	0	0	0	19	0.1278	0
50-54	0	0	0	0	17	0.1982	0
55-59	0	0	0	0	2	0.0296	0
60+	0	0	0	0	1	0.0365	0
	--	--	--	--	---	-----	--
TOTALS	0	0	0	0	95	0.5613	0

* AN "EXPOSED TO RISK" OF "1" MEANS ONE PERSON EXPOSED DURING ONE YEAR TO THE RISK BEING OBSERVED. A PERSON EXPOSED DURING EACH OF THE 4 YEARS APPEARS IN THIS COLUMN 4 TIMES.

IF MORE LIABILITIES ARE RELEASED BY DEATHS THAN EXPECTED, THERE WILL BE A GAIN TO THE PLAN. IF SMALLER RELEASES, A LOSS.

SCHEDULE 3.

RICHFIELD FIREMEN'S RELIEF ASSOCIATION

DISABILITY OF ACTIVE MEMBERS

ACTUAL & EXPECTED

ATTAINED AGES	NUMBER OF ACTUAL EVENTS				CALENDAR YEARS 1975-1978		
	-----				EXPOSED TO RISK *	NUMBER OF EVENTS	
	1975	1976	1977	1978		EXPECTED	ACTUAL
-----	-----	-----	-----	-----	-----	-----	-----
20-24	0	0	0	0	1	0.0008	0
25-29	0	0	0	0	7	0.0056	0
30-34	0	0	0	0	9	0.0072	0
35-39	0	0	0	0	14	0.0187	0
40-44	0	0	0	0	25	0.0563	0
45-49	0	0	0	1	19	0.0622	1
50-54	1	0	0	1	17	0.1099	2
55-59	0	0	0	0	2	0.0178	0
60+	0	0	0	0	1	0.0166	0
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TOTALS	1	0	0	2	95	0.2951	3

* AN "EXPOSED TO RISK" OF "1" MEANS ONE PERSON EXPOSED DURING ONE YEAR TO THE RISK BEING OBSERVED. A PERSON EXPOSED DURING EACH OF THE 4 YEARS APPEARS IN THIS COLUMN 4 TIMES.

IF MORE LIABILITIES ARE CREATED BY DISABILITY CLAIMS THAN EXPECTED, THERE WILL BE A LOSS TO THE PLAN. OTHERWISE, A GAIN.

SCHEDULE 4.

RICHFIELD FIREMEN'S RELIEF ASSOCIATION
AGES WHEN AGE & SERVICE RETIREMENT BEGAN
ACTUAL & EXPECTED

ATTAINED AGES -----	NUMBER OF ACTUAL EVENTS				CALENDAR YEARS 1975-1978		
	-----				EXPOSED TO RISK *	NUMBER OF EVENTS	
	1975	1976	1977	1978		EXPECTED	ACTUAL
-----	-----	-----	-----	-----	-----	-----	-----
UNDER 50	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
51	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0
54	0	0	1	0	0	0	1
55	0	0	1	0	0	0	1
56	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0
65+	1	0	0	0	1	1	1
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TOTALS	1	0	2	0	1	1	3

* AN "EXPOSED TO RISK" OF "1" MEANS ONE PERSON EXPOSED DURING ONE YEAR TO THE RISK BEING OBSERVED. A PERSON EXPOSED DURING EACH OF THE 4 YEARS APPEARS IN THIS COLUMN 4 TIMES.

IF ACTIVE MEMBERS RETIRE AT OLDER AGES THAN ASSUMED, THERE IS A GAIN TO THE PLAN. IF YOUNGER AGES, A LOSS.

SCHEDULE 5.

RICHFIELD FIREMEN'S RELIEF ASSOCIATION

DEATHS OF DISABILITY RETIRANTS

ACTUAL & EXPECTED

ATTAINED AGES	NUMBER OF ACTUAL EVENTS				CALENDAR YEARS 1975-1978		
					EXPOSED TO RISK *	NUMBER OF EVENTS	
	1975	1976	1977	1978		EXPECTED	ACTUAL
20-24	0	0	0	0	0	0.0000	0
25-29	0	0	0	0	0	0.0000	0
30-34	0	0	0	0	0	0.0000	0
35-39	0	0	0	0	0	0.0000	0
40-44	0	0	0	0	3	0.0136	0
45-49	0	0	0	0	4	0.0247	0
50-54	0	0	0	0	15	0.1568	0
55-59	0	0	0	0	4	0.0628	0
60-64	0	0	0	0	0	0.0000	0
65-69	0	0	0	0	0	0.0000	0
70-74	0	0	0	0	1	0.0654	0
75-79	0	0	0	0	3	0.2298	0
80-84	0	0	0	0	0	0.0000	0
85-89	0	0	0	0	0	0.0000	0
90+	0	0	0	0	0	0.0000	0
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TOTALS	0	0	0	0	30	0.5531	0

* AN "EXPOSED TO RISK" OF "1" MEANS ONE PERSON EXPOSED DURING ONE YEAR TO THE RISK BEING OBSERVED. A PERSON EXPOSED DURING EACH OF THE 4 YEARS APPEARS IN THIS COLUMN 4 TIMES.

IF MORE LIABILITIES ARE RELEASED BY DEATHS THAN EXPECTED, THERE WILL BE A GAIN TO THE PLAN. IF SMALLER RELEASES, A LOSS.

SCHEDULE 6.

RICHFIELD FIREMEN'S RELIEF ASSOCIATION
DEATHS OF NON-DISABILITY RETIRED LIVES
ACTUAL & EXPECTED

ATTAINED AGES	NUMBER OF ACTUAL EVENTS				CALENDAR YEARS 1975-1978		
					EXPOSED TO RISK *	NUMBER OF EVENTS	
	1975	1976	1977	1978		EXPECTED	ACTUAL
UNDER 40	0	0	0	0	0	0.0000	0
40-44	0	0	0	0	0	0.0000	0
45-49	0	0	0	0	1	0.0043	0
50-54	0	0	0	0	5	0.0418	0
55-59	0	0	0	0	6	0.1010	0
60-64	0	0	0	0	16	0.4534	0
65-69	0	0	0	0	12	0.4624	0
70-74	0	1	0	1	4	0.1823	2
75-79	0	0	0	0	10	0.7308	0
80-84	0	0	0	0	3	0.3739	0
85-89	0	1	0	0	1	0.1604	1
90+	0	0	0	0	0	0.0000	0
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TOTALS	0	2	0	1	58	2.5103	3

* AN "EXPOSED TO RISK" OF "1" MEANS ONE PERSON EXPOSED DURING ONE YEAR TO THE RISK BEING OBSERVED. A PERSON EXPOSED DURING EACH OF THE 4 YEARS APPEARS IN THIS COLUMN 4 TIMES.

- IF MORE LIABILITIES ARE RELEASED BY DEATHS THAN EXPECTED, THERE WILL BE A GAIN TO THE PLAN. IF SMALLER RELEASES, A LOSS.

Valuation Financial Assumptions & Funding Methods

The rate of investment return (interest) used in making the valuation was 5.0 percent per annum, compounded annually.

The mortality table used was the United States Life Table, 1959-61, White Males and White Females.

Sample Ages	Single Life Values:				Future Life Expectancy (Years)	
	Present Value of \$1 Monthly					
	Level		Increasing			
	For Life		3.5% Yearly			
	Men	Women	Men	Women	Men	Women
45	\$169.61	\$186.84	\$263.23	\$304.86	27.33	32.52
50	154.85	174.20	229.51	270.80	23.22	28.08
55	139.29	159.62	197.24	236.11	19.45	23.81
60	122.79	142.73	166.26	200.76	16.01	19.69
65	106.31	124.22	137.82	166.16	12.97	15.88
70	89.86	104.31	111.71	132.82	10.29	12.38
75	73.39	83.92	87.66	101.94	7.92	9.28
80	57.54	64.24	66.29	74.77	5.89	6.67

Age & service retirement was assumed to occur at age 60, or attained age if older.

Sample Rates of Separation From Active Employment Before Retirement, Death or Disability

<u>Sample Ages</u>	<u>% of Active Members Separating Within Next Year</u>
20	3.00%
25	2.50
30	2.00
35	1.50
40	1.00
45	0.50
50+	0.00

Sample Pay Adjustment Factors used to Project Current Pays

<u>Sample Ages</u>	<u>Present Pay Resulting in Pay of \$1,000 at Age 60</u>	<u>Percent Increase in Pay During Next Year</u>
20	\$ 253	3.5%
25	300	3.5
30	356	3.5
35	423	3.5
40	503	3.5
45	597	3.5
50	709	3.5
55	842	3.5
60	1,000	3.5

Total covered payroll for active members is assumed to increase 3.5% annually.

An entry age-normal cost method of valuation was used in determining the normal cost of age & service benefits (including benefits for death after age & service retirement), and in determining accrued liabilities.

The percent-of-payroll contribution rate for unfunded accrued liabilities ("UAL") was determined by multiplying the UAL by 5%, and then dividing by the active member covered annual payroll.

These steps conform to State law.

The contribution for UAL is equivalent to amortization by level (principal & interest combined) percent-of-payroll contributions over a period of 25 future years.

Disability & Death-before-retirement. Contributions for these casualty benefits were determined using a terminal funding method.

Disability retirements were assumed to occur as indicated below (these assumptions differ from 12-31-76 assumptions):

<u>Sample Ages</u>	<u>% of Active Members Becoming Disabled Within Next Year</u>
20	0.08%
25	0.08
30	0.08
35	0.08
40	0.20
45	0.26
50	0.49
55	0.89