

The Report of the  
GAIN/LOSS ANALYSIS OF FINANCIAL EXPERIENCE  
During calendar 1982  
City of Richfield Fire Department  
Relief Association  
Richfield, Minnesota

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GABRIEL, ROEDER, SMITH & COMPANY  
ACTUARIES & CONSULTANTS

2090 First National Building  
Detroit, Michigan 48226  
Area 313: 961-3346

April 19, 1983

Board of Trustees

City of Richfield Fire Department Relief Association

Richfield, Minnesota

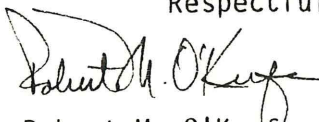
Submitted in this report are the results of the 1982 gain/loss analysis of the financial experiences of the Richfield Fire Department Relief Association.

The composite results of this study are reported on Schedule 1, and comments regarding the results are on page 12.

The gain/loss analysis was based upon statistical data furnished by the Association regarding active and retired member changes and related financial transactions.

The actuarial assumptions used for regular valuation purposes and which produce "expected" experience data are shown in the appendix of this report. A brief summary of the Association's benefits is also included in the appendix.

Respectfully submitted,

  
Robert M. O'Keefe

  
Gary W. Findlay

## PURPOSE OF GAIN/LOSS ANALYSIS

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Actual financial experience will not coincide exactly with assumed financial experience--differences are to be expected since the future cannot be predicted with absolute precision. The changes in computed liabilities resulting from differences between actual and assumed experiences are called actuarial gains, if the experience was financially favorable and actuarial losses, if the experience was financially unfavorable. Actuarial gains result in decreases in contribution rates and actuarial losses result in increases.

Regular actuarial valuations provide information about aggregate computed liabilities. However, regular valuations do not develop the information needed to explain the year to year changes in computed liabilities attributable to each activity within the retirement system financial mechanism. The purpose of a gain/loss analysis is to determine the change in computed liabilities and contribution rates attributable to variations between actual and assumed experience.

Once a difference between actual and assumed experience in a risk area has been observed to be sizeable and persistent, the assumed experience should be changed to reflect the observed reality. However, gains and losses over a relatively short period of time may not be indicative of long term trends which provide the basis for selection of actuarial assumptions.

## ACTIVITY WHICH RESULTS IN GAINS OR LOSSES

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### Age & Service Retirement.

If members retire at older ages than assumed, there is a gain. If retirements occur at younger ages than assumed there is a loss.

### Disability & Death-in-Service.

If casualty claims are less than assumed, there is a gain. If there are more casualty losses than assumed, there is a loss.

### Withdrawal.

If more liabilities are released by withdrawal than assumed, there is a gain.  
If there are fewer withdrawals than assumed, there is a loss.

### Salary Increases.

If there are smaller salary increases than assumed, there is a gain.  
If salary increases are greater than assumed, there is a loss.

### Investment Income.

If there is greater investment income than assumed, there is a gain.  
If investment income is less than assumed, there is a loss.

### Post Retirement Mortality.

If benefit recipients die at younger ages than assumed, there is a gain.  
If they live longer than assumed, there is a loss.

### Contribution.

Gains or losses arise due to the delay in implementing changes in the recommended contribution.

### Miscellaneous.

Miscellaneous gains and losses include changes due to data adjustments, rounding and changes in the average age and service characteristics of the group.

Richfield Fire Department Relief Association

Schedule 1.

Gains & Losses in Accrued Liabilities  
and Changes in Contribution Requirements  
During Calendar 1982

<u>Type of Activity</u>	<u>Accrued Liabilities</u> <u>(Gain or Loss *</u>		<u>Contribution Requirements</u> <u>(Gain) or Loss*</u>	
	<u>Active</u>	<u>Retirants &amp;</u>	<u>Normal Cost</u>	<u>\$ Payment</u>
	<u>Members</u>	<u>Beneficiaries</u>	<u>% of Payroll</u>	<u>on UAL</u>
	(\$ in 1,000)		(\$ in 1,000)	
<u>Age &amp; Service Retirements</u>	\$ 85.14	\$ N/A	(0.27)%	\$ 5.67
<u>Disability &amp; Death-in-Service</u>				
a. <u>Disability</u>	(10.39)	N/A	(0.05)	(0.69)
b. <u>Death-in Service</u>	(13.33)	N/A	(0.05)	(0.89)
<u>Withdrawal</u>	1.78	N/A	0.02	0.12
<u>Salary Increases</u>	23.09	84.34	N/A	7.16
<u>Investment Income</u>	(7.51)	(90.27)	N/A	(6.52)
<u>Post Retirement Mortality</u>	N/A	37.98	N/A	2.53
<u>Contribution</u>	0.87	75.82	N/A	5.11
<u>Miscellaneous</u>	5.90	7.99	0.00	0.93
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$ 85.55	\$115.86	(0.35)%	\$13.42
<u>Changes due to plan amendments</u>	0.00	0.00	0.00	0.00
TOTAL (GAIN)/LOSS DURING YEAR	\$ <u>85.55</u>	\$ <u>115.86</u>	<u>(0.35)%</u>	<u>\$13.42</u>

\* Accrued liabilities and contribution requirements are affected by gains and losses.  
Gains result in reductions in both and losses result in increases in both.

Richfield Fire Department Relief Association

Schedule 2.

Gains & Losses in Accrued Liabilities  
From January 1, 1979 thru December 31, 1981

Type of Activity	1/1/79 - 12/31/79		1/1/80 - 12/31/80		1/1/81 - 12/31/81	
	Accrued Liabilities		Accrued Liabilities		Accrued Liabilities	
	(Gain) or Loss		(Gain) or Loss		(Gain) or Loss	
	Active	Retirants &	Active	Retirants &	Active	Retirants &
	Members	Beneficiaries	Members	Beneficiaries	Members	Beneficiaries
	(\$ in 1,000)		(\$ in 1,000)		(\$ in 1,000)	
<u>Age &amp; Service Retirements</u>	\$(22.88)	\$ N/A	\$ 49.88	\$ N/A	\$ 0.00	\$ N/A
<u>Disability &amp; Death-in-Service</u>						
a. <u>Disability</u>	305.10	N/A	(9.65)	N/A	178.76	N/A
b. <u>Death-in Service</u>	(30.08)	N/A	(32.53)	N/A	(13.14)	N/A
<u>Withdrawal</u>	4.46	N/A	5.58	N/A	1.53	N/A
<u>Salary Increases</u>	100.34	350.94	68.06	220.82	84.50	285.70
<u>Investment Income</u>	N/A	N/A	(6.73)	(64.13)	(5.32)	(68.08)
<u>Post Retirement Mortality</u>	N/A	40.76	N/A	11.57	N/A	31.91
<u>Contribution</u>	N/A	N/A	26.93	51.82	0.71	81.46
<u>Miscellaneous</u>	29.52	32.39	6.39	13.85	5.44	7.29
EXPERIENCE RELATED (GAIN)/LOSS	\$386.46	\$424.09	\$107.93	\$233.93	\$252.48	\$338.28
Method Change for Casualty Cost			109.95			
<u>Changes Due to Plan Amendments</u>	N/A	N/A	13.69	0.00	0.00	0.00
TOTAL (GAIN)/LOSS DURING PREVIOUS 3 YEAR PERIOD	<u>\$386.46</u>	<u>\$424.09</u>	<u>\$231.57</u>	<u>\$233.93</u>	<u>\$252.48</u>	<u>\$338.28</u>

Richfield Fire Department Relief Association

Schedule 3.

Employees Active at Both Beginning & End of 1982

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<u>Age Group Beg. Year</u>	<u>No.</u>	<u>Beginning Salary</u>	<u>Ending Salary</u>	<u>% Increase In Salary</u>
25-29	4	\$102,172	\$107,480	5.2%
30-34	4	102,172	107,480	5.2
35-39	1	25,543	26,870	5.2
40-44	3	76,629	80,610	5.2
45-49	3	76,629	80,610	5.2
50-54	<u>2</u>	<u>51,086</u>	<u>53,740</u>	5.2
TOTALS	17	\$434,231	\$456,790	5.2%

Employees Active at Either Beginning or End of 1982

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<u>Years Service</u>	<u>Beginning of Year</u>	<u>End of Year</u>
2	3	
3	2	3
4		2
5 or more	13	12

Average Age: 39.0 years.

Average Service: 11.4 years.

Richfield Fire Department Relief Association

Schedule 4.

Comparative Schedule

Of Active Members

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Valuation Date December 31	Active Members	Valuation Payroll	Average			
			Age	Service	Pay	% Incr.
1978	20	\$378,580	41.4 yrs.	11.9 yrs.	\$18,929	
1979	20	425,160	38.4	10.0	21,258	12.3%
1980	19	441,180	38.4	10.5	23,220	9.2
1981	18	459,774	38.9	11.0	25,543	10.0
1982	17	456,790	39.0	11.4	26,870	5.2

Richfield Fire Department Relief Association

Schedule 5.

Separations From Active Service Due to Withdrawal

During Four Year Period Ended December 31, 1982

Age at Termination	1979		1980		1981		1982	
	Actual	Expected	Actual	Expected	Actual	Expected	Actual	Expected
20-24		*		0.1				
25-29		*		0.1		0.1		0.1
30-34		0.1				0.1		0.1
35-39		*						
40-44		*						
45-49		*						
50-54		*						
55-59		*						
Totals	0	0.2	0	0.2	0	0.2	0	0.2

Total actual during four year period 0  
Total expected during four year period 0.8

Years Service at Termination	1979		1980		1981		1982	
	Actual	Expected	Actual	Expected	Actual	Expected	Actual	Expected
0		*		0.1				
1		*						
2		*						
3		*						
4		*						
5 or more		0.1		0.1		0.2		0.2
Totals	0	0.2	0	0.2	0	0.2	0	0.2

\* Less than 0.1%

Richfield Fire Department Relief Association

Schedule 6.

Separations From Active Service Due to Death and Disability

During Four Year Period Ended December 31, 1982

Death Separations

Age at Time of Death	1979		1980		1981		1982	
	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>
20-24		*		*		*		
25-29		*		*		*		*
30-34		*		*		*		*
35-39		*		*		*		*
40-44		*		*		*		*
45-49		*		*		*		*
50-54		*		*		*		*
55-59		*		*		*		*
Totals	<u>0</u>	<u>0.1</u>	<u>0</u>	<u>0.1</u>	<u>0</u>	<u>0.1</u>	<u>0</u>	<u>0.1</u>

Total actual during four year period 0

Total expected during four year period 0.4

Disability Separations

Age at Time of Disability	1979		1980		1981		1982	
	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>
20-24		*		*				
25-29		*		*				
30-34		*		*				
35-39		*		*				
40-44		*		*				
45-49	1	*		*	1			
50-54	1	*		*				
55-59		*		*				
Totals	<u>2</u>	<u>0.1</u>	<u>0</u>	<u>0.1</u>	<u>1</u>	<u>0.0</u>	<u>0</u>	<u>0.0</u>

Total actual during four year period 3

Total expected during four year period 0.2

Richfield Fire Department Relief Association

Schedule 7.

Separations From Active Service  
For Age & Service Retirement

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Age at Termination	1979		1980		1981		1982	
	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>
53	1							
56							1	
57	<u>—</u>		<u>1</u>		<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
TOTALS	1		1		0	0	1	0.0

Average age at retirement during period examined was 56.0 years.

Average service at retirement during period examined was 20.7 years.

Richfield Fire Department Relief Association

Schedule 8.

Death After Retirement  
(Disability and Service Retirants)

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Age at Death	1979		1980		1981		1982	
	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>
45-49		0.0197		0.0219		0.0219		0.0154
50-54		0.0502		0.0405		0.0323		0.0444
55-59		0.0962		0.1354		0.1468		0.1320
60-64		0.0258		0.0280		0.0520		0.0672
65-69		0.1790		0.1928		0.2072		0.1142
70-74		0.0470		0.0505		0.0543		0.1995
75-79		0.1802	1	0.0978				
80-84	<u>—</u>	<u>0.1235</u>	<u>1</u>	<u>0.1026</u>	<u>—</u>	<u>0.1127</u>	<u>—</u>	<u>0.1235</u>
TOTALS	0	0.7216	2	0.6695	0	0.6272	0	0.6962

Total actual during four year period 2

Total expected during four year period 2.7145

## COMMENTS

### Economic Assumptions and Financing Method

The economic assumptions of 5% annual investment return and 3 1/2% annual salary increases are established by state law. State law also specifies that the annual minimum obligation of the municipality shall be determined by adding (i) the employer normal cost percent times covered payroll to (ii) the level dollar amount required to amortize the unfunded accrued liability by December 31, 2010.

Over the past few years, both the actual rates of salary increase and investment return have generally exceeded the assumed rates, resulting in increases in the dollar amount of unfunded accrued liabilities. If the financial experiences of recent years persist, and the economic assumptions and financing method are not changed, it is reasonable to expect that unfunded accrued liabilities will increase in actual dollar amount for a number of years. This is true even though a level dollar amortization schedule is being followed. Accordingly, it is reasonable to expect that under the described conditions the actual dollar contributions required to make amortization payments will increase for a number of years. The notion that amortization dollar amounts will be increasing is not necessarily cause for alarm. If adjusted for changes in purchasing power, future increases in the dollar contributions may or may not reflect increases in terms of real dollars (inflation adjusted dollars).

It is also worth noting that when the same assumptions and methods are applied to plans which differ in nature, the valuation results may not be comparable (for example, it is currently not valid to compare valuation results for a plan having full escalation to valuation results for a plan having a 3 1/2% cap on escalation.) Caution should be exercised when attempting to assess the financial condition of one Association relative to another on the basis of valuation results produced using the assumptions and methods mandated by state law.

## APPENDICES

# Richfield Fire Department Relief Association

## Valuation Methods and Assumptions

The Entry Age Normal Cost method was used to determine the normal cost of all benefits.

The rate of investment return (interest) used in making the valuation was 5.0 percent per annum, compounded annually. State law requires use of this assumption.

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

Sample Ages	Single Life Values: Present Value of \$1 Monthly				Future Life Expectancy (Years)	
	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

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

Pay Adjustment Factor used to Project Current Pays

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<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

Use of the pay adjustment factor illustrated above is required by state law.

Disability retirements were assumed to occur as indicated below:

<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

Richfield Fire Department Relief Association

Brief Summary (12/31/82) of Benefit Provisions Evaluated and/or Considered

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Age & Service Retirement

Eligibility. 20 years of service and 50 years of age if hired before 1/1/68.  
20 years of service and 55 years of age if hired after 12/31/67.

Amount. 51% of base pay.

Pay Used For Plan Purposes. "Base pay" means the salary of a first grade firefighter.

Disability Retirement

Eligibility. Disabled to the extent that unable to perform the duties of a firefighter before being eligible for age & service retirement.

Amount. 50% of base pay.

Member's Death While Active, Or In Deferred Status, Or Retired

Eligibility.

Spouse. Legally married to member before separation from service and residing with member at time of death. Benefits terminate upon remarriage.

Child. Younger than age 18.

Amount.

Spouse. 40% of base pay.

Child. 5% of base pay per child if mother is living. 15% of base pay per child if mother is deceased.

Maximum Family Benefit. 50% of base pay.

Funeral Expenses. \$500 lump sum payment.

Vested Deferred. Separated before reaching eligible retirement age. Payment beginning is deferred to attainment of age 50 or 55 depending on the date hired. For member with less than 20 years service, benefit amount is 51% of base pay times total years service divided by 20.

Post Retirement Adjustments ("Escalator"). Each time base pay is changed, benefit payments to all benefit recipients are simultaneously changed by the same percent that base pay is changed.

Member Contributions. 8% of base pay. Total member contributions are refundable, without interest, if no monthly benefit is chosen upon separation from service.