

The Report of the  
GAIN/LOSS ANALYSIS OF FINANCIAL EXPERIENCE  
During calendar 1979 and 1980  
CITY OF VIRGINIA  
FIRE DEPARTMENT RELIEF ASSOCIATION  
Virginia, Minnesota

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GABRIEL, ROEDER, SMITH & COMPANY

ACTUARIES & CONSULTANTS

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June 19, 1981

City of Virginia  
Fire Department Relief Association  
Virginia, Minnesota

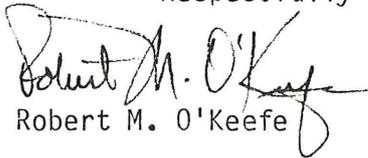
Submitted in this report are the results of the 1979-80 gain/loss analysis of the financial experiences of the Virginia Fire Department Relief Association.

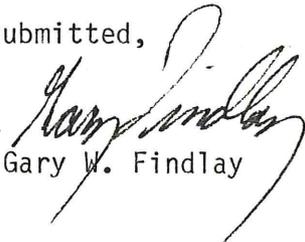
The composite results of this study are reported on Schedules 1(A) and 1(B) and comments regarding the results are on page 12.

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.

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.

VIRGINIA FIRE DEPARTMENT RELIEF ASSOCIATION

Schedule 1(A)

Gains & Losses in Accrued Liabilities  
and Changes in Contribution Requirements  
During Calendar 1979

<u>Type of Activity</u>	<u>Accrued Liabilities (Gain) or Loss</u>		<u>Contribution Requirements (Gain) or Loss</u>	
	<u>Active Members</u> (\$ in 1,000)	<u>Retirants &amp; Beneficiaries</u>	<u>Normal Cost % of Payroll</u> (\$ in 1,000)	<u>\$ Payment on UAL</u>
<u>Age &amp; Service Retirements</u>	\$(8.95)	\$ N/A	N/A	\$(0.57)
<u>Disability &amp; Death-in-Service</u>				
a. <u>Disability</u>	(4.17)	N/A	N/A	(0.26)
b. <u>Death-in Service</u>	4.49	N/A	N/A	0.28
<u>Withdrawal</u>	0.65	N/A	N/A	0.04
<u>Salary Increases</u>	65.74	0	N/A	4.17
<u>Investment Income</u>	4.57	16.50	N/A	1.34
<u>Post Retirement Mortality</u>	N/A	8.39	N/A	0.53
<u>Contributions</u>	(4.86)	(7.44)	N/A	(0.78)
<u>Miscellaneous</u>	(10.82)	(3.29)	N/A	(0.89)
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$46.65	\$14.16	N/A	\$3.86
<u>Changes due to plan amendments</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
TOTAL (GAIN)/LOSS DURING YEAR	<u>\$46.65</u>	<u>\$14.16</u>	<u>N/A</u>	<u>\$3.86</u>

VIRGINIA FIRE DEPARTMENT RELIEF ASSOCIATION

Schedule 1(B)

Gains & Losses in Accrued Liabilities  
and Changes in Contribution Requirements  
During Calendar 1980

<u>Type of Activity</u>	<u>Accrued Liabilities (Gain) or Loss</u>		<u>Contribution Requirements (Gain) or Loss</u>	
	<u>Active Members</u> (\$ in 1,000)	<u>Retirants &amp; Beneficiaries</u> (\$ in 1,000)	<u>Normal Cost % of Payroll</u> (\$ in 1,000)	<u>\$ Payment on UAL</u> (\$ in 1,000)
<u>Age &amp; Service Retirements</u>	\$(13.05)	\$ N/A	(0.01)%	\$(0.84)
<u>Disability &amp; Death-in-Service</u>				
a. <u>Disability</u>	(4.56)	N/A	(0.01)	(0.29)
b. <u>Death-in Service</u>	(3.90)	N/A	0.62	(0.25)
<u>Withdrawal</u>	0.50	N/A	0.15	0.03
<u>Salary Increases</u>	152.58	0	N/A	9.83
<u>Investment Income</u>	(1.86)	(5.79)	N/A	(0.49)
<u>Post Retirement Mortality</u>	N/A	9.68	N/A	0.62
<u>Contributions</u>	(7.17)	(10.68)	N/A	(1.15)
<u>Miscellaneous</u>	<u>(6.19)</u>	<u>(25.78)</u>	<u>N/A</u>	<u>(2.06)</u>
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$116.35	\$(32.57)	0.75 %	\$ 5.40
<u>Conversion to UAL Amortization</u>	N/A	N/A	N/A	N/A
<u>Change in Funding Method For Death &amp; Disability</u>	52.10	N/A	0.35	3.36
<u>Changes due to plan amendments</u>	<u>515.24</u>	<u>251.14</u>	<u>7.81</u>	<u>49.39</u>
TOTAL (GAIN)/LOSS DURING YEAR	<u>\$683.69</u>	<u>\$218.57</u>	<u>8.91 %</u>	<u>\$58.15</u>

VIRGINIA FIRE DEPARTMENT RELIEF ASSOCIATION

Schedule 2(A)

Employees Active at Both Beginning & End of 1979

<u>Age Group Beg. Year</u>	<u>No.</u>	<u>Beginning Salary</u>	<u>Ending Salary</u>	<u>% Increase In Salary</u>
35-39	1	\$ 15,438	\$ 16,855	9.2%
40-44	1	14,822	16,212	9.4
45-49	4	62,072	68,149	9.8
50-54	4	63,457	68,925	8.6
55-59	4	66,253	72,816	9.9
60-64	<u>3</u>	<u>56,193</u>	<u>61,060</u>	8.7
TOTALS	17	\$278,235	\$304,017	9.3%

Employees Active at Either Beginning or End of 1979

<u>Years Service</u>	<u>Beginning of Year</u>	<u>End of Year</u>
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5 or more	17	17

Average Age: 53.3 years.

Average Service: 22.4 years.

VIRGINIA FIRE DEPARTMENT RELIEF ASSOCIATION

Schedule 2(B)

Employees Active at Both Beginning & End of 1980

<u>Age Group Beg. Year</u>	<u>No.</u>	<u>Beginning Salary</u>	<u>Ending Salary</u>	<u>% Increase In Salary</u>
35-39	1	\$ 16,855	\$ 19,846	17.7%
40-44	1	16,212	19,018	17.3
45-49	4	68,149	79,944	17.3
50-54	4	68,925	81,452	18.2
55-59	4	72,816	83,971	15.3
60-64	1	18,046	21,017	16.5
65-69	<u>1</u>	<u>23,310</u>	<u>25,560</u>	9.7
TOTALS	16	\$284,313	\$330,808	16.4%

Employees Active at Either Beginning or End of 1980

<u>Years Service</u>	<u>Beginning of Year</u>	<u>End of Year</u>
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5 or more	17	16

Average Age: 53.6 years.

Average Service: 22.5 years.

VIRGINIA FIRE DEPARTMENT RELIEF ASSOCIATION

Schedule 3(A)

Separations From Active Service (Other Than Age & Service Retirement)  
During 1979

<u>Age at Termination</u>	<u>Withdrawal</u>		<u>Disability</u>		<u>Death</u>	
	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>
35-39				*		*
40-44				*		*
45-49				*		*
50-54				*		*
55-59				*		*
60-64	—	—	—	—	—	<u>0.1</u>
TOTALS	0	0.0	0	0.1	0	0.2

\* Less than 0.1%

<u>Years Service at Termination</u>	<u>Actual</u>	<u>Expected</u>
0		
1		
2		
3		
4		
5 or more	—	—
TOTALS	0	0.0

Average age at separation: N/A.

Average service at separation: N/A.

VIRGINIA FIRE DEPARTMENT RELIEF ASSOCIATION

Schedule 3(B)

Separations From Active Service (Other Than Age & Service Retirement)  
During 1980

Age at Termination	Withdrawal		Disability		Death	
	Actual	Expected	Actual	Expected	Actual	Expected
35-39				*		*
40-44				*		*
45-49				*		*
50-54				*		*
55-59				*		*
60-64				*		*
65-69	—	—	—	—	—	<u>0.1</u>
TOTALS	0	0.0	0	0.1	0	0.3

\* Less than 0.1%

Years Service at Termination	Actual	Expected
0		
1		
2		
3		
4		
5 or more	—	—
TOTALS	0	0.0

Average age at separation: N/A.

Average service at separation: N/A.

VIRGINIA FIRE DEPARTMENT RELIEF ASSOCIATION

Schedule 4

Separations From Active Service  
For Age & Service Retirement

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<u>Age at Termination</u>	1979		1980	
	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>
62				1.0
64		2.0		
65 & Over	—	—	<u>1</u>	<u>2.0</u>
TOTALS	0	2.0	1	3.0

Average age at retirement during period examined: 65 years.

Average service at retirement during period examined: 37.9 years.

VIRGINIA FIRE DEPARTMENT RELIEF ASSOCIATION

Schedule 5

Death After Retirement  
(Disability and Service Retirants)

<u>Age at Death</u>	1979		1980	
	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>
50-54		0.0091		0.0101
55-59		0.0320		0.0347
65-69		0.1924		0.2396
75-79		0.0795		0.0863
80-84		0.1341		0.1439
85-89	—	<u>0.1798</u>	—	<u>0.1943</u>
TOTALS	0	0.6269	0	0.7089

Average age at death: N/A.

## Comments

### Miscellaneous Gain (Loss)

The miscellaneous gains in 1979 and 1980 evolve from the asset information provided. The investment income other than the checking account of the association was not shown. As such it could not be recognized in detail.

APPENDICES

VIRGINIA FIRE DEPARTMENT RELIEF ASSOCIATION

Valuation Methods and Assumptions

The Entry Age Normal Cost method was used to determine the normal cost of all benefits. Disability and death before retirement benefits were valued in previous valuations on a terminal funding basis (one year term cost).

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: Present Value of \$1 Monthly				Future Life Expectancy (Years)	
	Level For Life		Increasing 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 62, 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

Sample Pay Adjustment Factors 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

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

Virginia Fire Department Relief Association

Brief Summary (12/31/80) of Benefit Provisions Evaluated and/or Considered

Age & Service Retirement

Eligibility. 20 years of service and 50 years of age.

Amount. For first 20 years of service, 45% of final year's salary. For each year in excess of 20 an additional 1% is added to a maximum of 50% of final year's salary for 25 or more years of service. For each year over 25 an additional 1/2% of base pay is added to the benefit. (The latter additional benefit is not subject to the post retirement provisions.)

Disability Retirement

Eligibility. Totally or partially disabled to the extent that no longer able to perform duties of a fireman before being eligible for age & service retirement.

Amount.

Total Disability. 50% of final year's salary.

Partial Disability. 35% of final year's salary.

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. 50% of benefit deceased was receiving or would have been eligible to receive. Based on minimum of 20 years of service.

Child. \$300 per child per year.

Maximum Family Benefit. Amount deceased was receiving or would have been eligible to receive.

Vested Deferred. 20 years of service and separated before age 50. Payment beginning is deferred to attainment of age 50.

Post Retirement Adjustments ("Escalator"). Benefit payments to retired members are increased each January by the lesser of the following percentages: (1) 3 1/2% or (2) the preceeding year's percentage increase in the salary of a first grade firefighter.

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