

The Report of the  
GAIN/LOSS ANALYSIS OF FINANCIAL EXPERIENCE  
During calendar 1979 and 1980  
CITY OF COLUMBIA HEIGHTS  
FIRE VOLUNTEER RELIEF ASSOCIATION  
Columbia Heights, Minnesota

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GABRIEL, ROEDER, SMITH & COMPANY

ACTUARIES & CONSULTANTS

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

May 19, 1981

City of Columbia Heights  
Fire Volunteer Relief Association  
Columbia Heights, Minnesota

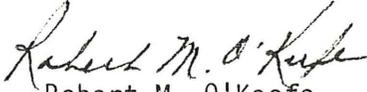
Submitted in this report are the results of the 1979-80 gain/loss analysis of the financial experiences of the City of Columbia Heights Fire Volunteer Relief Association.

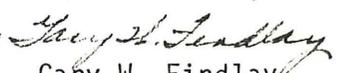
The composite results of this study are reported on Schedules 1(A) and 1(B) and comments regarding the results are on page 12.

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.

COLUMBIA HEIGHTS FIRE VOLUNTEER RELIEF ASSOCIATION

Schedule 1(A)

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

Type of Activity	Accrued Liabilities (Gain) or Loss		Contribution Requirements (Gain) or Loss	
	Active Members (\$ in 1,000)	Retirants & Beneficiaries (\$ in 1,000)	Normal Cost % of Payroll (\$ in 1,000)	\$ Payment on UAL
<u>Age &amp; Service Retirements</u>	\$ 0.0	\$ N/A	N.C.*	\$0.0
<u>Disability &amp; Death-in-Service</u>				
a. <u>Disability</u>	(0.7)	N/A	N.C.*	0.0
b. <u>Death-in Service</u>	(0.8)	N/A		0.0
<u>Withdrawal</u>	(2.6)	N/A		0.0
<u>Salary Increases</u>	0.0	0.0		0.0
<u>Investment Income</u>	(9.4)	(9.9)		0.0
<u>Post Retirement Mortality</u>	N/A	2.4	N/A	0.0
<u>Contribution</u>	0.0	0.0		0.0
<u>Miscellaneous</u>	<u>0.5</u>	<u>0.2</u>	—	<u>0.0</u>
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$(13.0)	\$(7.3)	N.C.*	\$0.0
<u>Changes due to plan amendments</u>	<u>0.0</u>	—	—	<u>0.0</u>
TOTAL (GAIN)/LOSS DURING YEAR	<u>\$(13.0)</u>	<u>\$(7.3)</u>	<u>N.C.*</u>	<u>\$0.0</u>

\* Not Computed.

COLUMBIA HEIGHTS FIRE VOLUNTEER RELIEF ASSOCIATION

Schedule 1(B)

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

Type of Activity	Accrued Liabilities (Gain) or Loss		Contribution Requirements (Gain) or Loss	
	Active Members	Retirants & Beneficiaries	Normal Cost \$ of Payroll	\$ Payment on UAL
	(\$ in 1,000)			
<u>Age &amp; Service Retirements</u>	\$ 0	\$ N/A	\$ (318)	\$0.0
<u>Disability &amp; Death-in-Service</u>				
a. <u>Disability</u>	(0.7)	N/A	(115)	0.0
b. <u>Death-in Service</u>	(0.8)	N/A	833	0.0
<u>Withdrawal</u>	(0.4)	N/A	37	0.0
<u>Salary Increases</u>	0.0	0.0	0	0.0
<u>Investment Income</u>	(9.5)	(7.0)	0	0.0
<u>Post Retirement Mortality</u>	N/A	(0.6)	N/A	0.0
<u>Contributions</u>	0.0	0.0		0.0
<u>Miscellaneous</u>	<u>0.0</u>	<u>0.0</u>		<u>0.0</u>
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$(11.4)	\$(7.6)	\$ 437	\$0.0
<u>Conversion to UAL Amortization</u>			N/A	0.0
<u>Change in Funding Method For Death &amp; Disability</u>	6.9	N/A	168	0.0
<u>Changes due to plan amendments</u>	<u>7.8</u>	<u>34.7</u>	<u>744</u>	<u>0.0</u>
TOTAL (GAIN)/LOSS DURING YEAR	\$ <u>3.3</u>	\$ <u>27.1</u>	\$ <u>1,349</u>	\$ <u>0.0</u>

COLUMBIA HEIGHTS FIRE VOLUNTEER 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>
20-24	4			
25-29	3			
30-34	2			
35-39	5			
40-44	2			
45-49	<u>2</u>			
TOTALS	18	N/A	N/A	N/A

Employees Active at Either Beginning or End of 1979

<u>Years Service</u>	<u>Beginning of Year</u>	<u>End of Year</u>
0	5	0
1	3	5
2	0	2
3	2	0
4	0	2
5 or more	10	9

Average Age: 33.5 years.

Average Service: 6.3 years.

COLUMBIA HEIGHTS FIRE VOLUNTEER 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>
20-24	3			
25-29	4			
30-34	2			
35-39	4			
40-44	2			
45-49	<u>3</u>			
TOTALS	18	N/A	N/A	N/A

Employees Active at Either Beginning or End of 1980

<u>Years Service</u>	<u>Beginning of Year</u>	<u>End of Year</u>
0	2	2
1	5	2
2	2	3
3	0	2
4	2	0
5 or more	9	11

Average Age: 34.3 years.

Average Service: 7.2 years.

COLUMBIA HEIGHTS FIRE VOLUNTEER RELIEF ASSOCIATION

Schedule 3(A)

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

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Age at Termination	Withdrawal		Disability		Death	
	Actual	Expected	Actual	Expected	Actual	Expected
20-24		0.1		*		*
25-29	1	0.1		*		*
30-34	1	0.1		*		*
35-39				*		0.1
40-44	—	—	—	*	—	*
TOTALS	2	0.3	0	0.0	0	0.1

\* Less than 0.1%

Years Service at Termination	Actual	Expected
0		0.2
1		
2	1	
3		
4		
5 of more	<u>1</u>	<u>0.1</u>
TOTALS	2	0.3

Average age at separation: 30.5 years.

Average service at separation: 4.3 years.

COLUMBIA HEIGHTS FIRE VOLUNTEER RELIEF ASSOCIATION

Schedule 3(B)

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

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<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>
20-24	2	*				
25-29		0.1				*
30-34		0.1				*
35-39		0.1				*
40-44	—	*	—	—	—	0.1
TOTALS	2	0.3	0	0.0	0	0.1

\* Less than 0.1%

<u>Years Service at Termination</u>	<u>Actual</u>	<u>Expected</u>
0		0.1
1		0.2
2	2	
3		
4		
5 of more	—	*
TOTALS	2	0.3

Average age at separation: 24.5 years.

Average service at separation: 1.6 years.

COLUMBIA HEIGHTS FIRE VOLUNTEER RELIEF ASSOCIATION

Schedule 4

Separations From Active Service  
For Age & Service Retirement

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<u>Age at Termination</u>	<u>1979</u>		<u>1980</u>	
	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>
50				
51				
52				
53				
54				
55				
56				
57				
58				
59				
60				
61				
62				
63				
64				
65 & Over	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
TOTALS	0	0.0	0	0.0

Average age at retirement during period examined: N/A.

Average service at retirement during period examined: N/A.

COLUMBIA HEIGHTS FIRE VOLUNTEER RELIEF ASSOCIATION

Schedule 5

Death After Retirement  
 (Disability and Service Retirants)

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Age at Death	1979		1980	
	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>
50-54		0.0222		0.0243
55-59		0.0153		0.0166
65-69		0.0765		0.0352
70-74		0.1446		0.2023
75-79	—	<u>0.1416</u>	—	<u>0.1530</u>
TOTALS	0	0.4002	0	0.4314

Average age at death: N/A

### Comments

Since the plan assets have exceeded accrued liabilities since 1978, there has been no contribution toward any unfunded accrued liability.

The dollar amount of the change in the normal cost between the 1978 and 1980 contribution is shown on the 1980 results.

APPENDICES

COLUMBIA HEIGHTS FIRE VOLUNTEER 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
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 58, 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

Columbia Heights Fire Department Relief Association (Volunteer Division)  
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, \$1,980 per year. For each year in excess of 20 an additional \$39.60 per year is added up to a maximum of \$2,376 per year for 30 or more years of service.

Disability Retirement

Eligibility. Disabled to the extent that no longer able to perform services required of a firefighter before being eligible for age & service retirement. If duty related, there is no service requirement. If non-duty related, member must have at least 10 years of service to qualify.

Amount. (1) Duty Related. Same as regular retirement assuming a minimum of 20 years of service.

(2) Non-Duty Related. For 10 years of service, \$594 per year. For each year in excess of 10 an additional \$72.60 per year is added up to a maximum of \$1,320 per year. Non-duty benefit payments do not begin until member reaches age 50.

Death Benefits

Eligibility.

Spouse. Legally married to member while active and at least 3 years prior to death and residing with member at time of death.

Child. Younger than age 16 or, if full time student, younger than age 18.

Amount. 1. If Death Occurs After 20 Years Service As Volunteer

Spouse. 40% of regular retirement benefit.

Child. \$99 per year per child with \$198 maximum per year.

Spouse and child benefits are not payable until such time as member would have reached age 50 had the member survived

2. If Death Occurs Prior To Completion Of 20 Years Service But After 10 Years Service And Death Is Not Duty Related.

Spouse. Lump sum payment of \$1,320 for first 10 years service plus \$176 for each full year in excess of 10 but less than 16 plus \$220 for each full year in excess of 15.

Child (maximum of 2). Lump sum payment of \$165 for first 10 years service plus \$22 for each full year in excess of 10 but less than 16 plus \$27.50 for each full year in excess of 15.

3. If Death Is Duty Related.

Spouse and Child. Same as benefits under 1. except that (i) benefits are payable immediately and (ii) if member was younger than age 50, benefits are based on 20 years service regardless of amount of actual service and at time member would have reached age 50 the benefit is recomputed to give credit for any actual service over 20 years.

In addition to the benefits listed, a lump sum payment of \$1,100 is paid to the surviving spouse or nearest living relative.

Vested Deferred

1. 10 But Less Than 20 Years Service.

Lump sum payment of \$3,300 for first 10 years plus \$440 per year for each full year in excess of 10 but less than 16 plus \$550 for each full year in excess of 15. Payment is deferred to age 50 and termination of service must have resulted from circumstances beyond the member's control.

2. More Than 20 Years Service And Separated Before Age 50.

Benefit amount is same as age & service benefit and payment beginning is deferred to attainment of age 50.

Member Contributions. None.