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The Report of the
GAIN/LOSS ANALYSIS OF FINANCIAL EXPERIENCE
During calendar 1979 and 1980
CITY OF CRYSTAL
POLICE RELIEF ASSOCIATION
Crystal, Minnesota

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GABRIEL, ROEDER, SMITH & COMPANY
CONSULTING ACTUARIES

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GAIN/LOSS ANALYSIS OF FINANCIAL EXPERIENCE
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GABRIEL, ROEDER, SMITH & COMPANY

ACTUARIES & CONSULTANTS

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

May 13, 1981

City of Crystal
Police Relief Association
Crystal, Minnesota

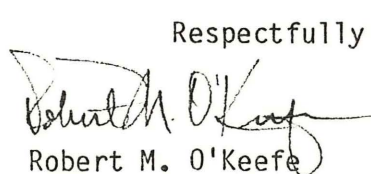
Submitted in this report are the results of the 1979-80 gain/loss analysis of the financial experiences of the City of Crystal Police Relief Association.

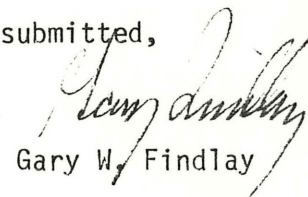
The composite results of this study are reported on Schedules 1(A) and 1(B) and comments regarding the results are on page 12.

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

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

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 casulaty 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.

CRYSTAL POLICE 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	Retirants &	Normal Cost	\$ Payment
	Members	Beneficiaries	% of Payroll	on UAL
	(\$ in 1,000)		(\$ in 1,000)	
<u>Age & Service Retirements</u>	\$ 0	\$ N/A	N/A%	\$ 0
<u>Disability & Death-in-Service</u>				
a. <u>Disability</u>	118.7	N/A	N/A	7.9
b. <u>Death-in Service</u>	(11.4)	N/A	N/A	(0.8)
<u>Withdrawal</u>	(6.1)	N/A	N/A	(0.4)
<u>Salary Increases</u>	42.2	50.1	N/A	6.2
<u>Investment Income</u>	(6.0)	(44.7)	N/A	(3.4)
<u>Post Retirement Mortality</u>	N/A	20.4	N/A	1.4
<u>Contributions</u>	(8.2)	(14.2)		(1.5)
<u>Miscellaneous</u>	<u>44.6</u>	<u>0.0</u>	<u>N/A</u>	<u>3.0</u>
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$173.8	\$11.6	N/A%	\$12.4
<u>Changes due to plan amendments</u>	<u>0</u>	<u>0</u>	<u>N/A</u>	<u>0</u>
TOTAL (GAIN)/LOSS DURING YEAR	<u>\$173.8</u>	<u>\$11.6</u>	<u>N/A%</u>	<u>\$12.4</u>

CRYSTAL POLICE 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</u> <u>(Gain) or Loss</u>		<u>Contribution Requirements</u> <u>(Gain) or Loss</u>	
	<u>Active</u> <u>Members</u> (\$ in 1,000)	<u>Retirants &</u> <u>Beneficiaries</u> (\$ in 1,000)	<u>Normal Cost</u> <u>% of Payroll</u> (\$ in 1,000)	<u>\$ Payment</u> <u>on UAL</u> (\$ in 1,000)
<u>Age & Service Retirements</u>	\$ 0	\$ N/A	0.45%	\$ 0
<u>Disability & Death-in-Service</u>				
a. <u>Disability</u>	(6.0)	N/A	(0.21)	(0.4)
b. <u>Death-in Service</u>	(9.9)	N/A	0.26	(0.7)
<u>Withdrawal</u>	(8.1)	N/A	0.19	(0.5)
<u>Salary Increases</u>	58.3	61.7	0	8.1
<u>Investment Income</u>	(6.9)	(58.9)	0	(4.4)
<u>Post Retirement Mortality</u>	N/A	13.4	N/A	0.9
<u>Contribution</u>	(18.2)	(13.0)	0	(2.1)
<u>Miscellaneous</u>	<u>69.4</u>	<u>0.0</u>	<u>0</u>	<u>4.7</u>
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$ 78.6	\$ 3.2	0.69%	\$5.6
<u>Conversion to UAL Amortization</u>			N/A	(4.1)
<u>Change in Funding Method For</u> <u>Death & Disability</u>	34.8	N/A	(0.78)	2.4
<u>Changes due to plan amendments</u>	<u>33.8</u>	<u>0</u>	<u>0.52</u>	<u>2.3</u>
TOTAL (GAIN)/LOSS DURING YEAR	<u>\$147.2</u>	<u>\$ 3.2</u>	<u>0.43%</u>	<u>\$6.2</u>

CRYSTAL POLICE 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	1	\$ 18,240	\$ 19,512	7.0%
25-29	3	54,720	58,536	7.0
30-34	6	109,440	117,072	7.0
35-39	1	18,240	19,512	7.0
40-44	4	72,960	78,048	7.0
45-49	3	54,720	58,536	7.0
50-54	3	54,720	58,536	7.0
TOTALS	21	\$383,040	\$409,752	7.0%

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	1	0
3	1	1
4	5	0
5 or more	16	20

Average Age: 39.1 years.

Average Service: 10.4 years.

CRYSTAL POLICE 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>
25-29	3	\$ 58,536	\$ 63,000	7.6%
30-34	6	117,072	126,000	7.6
35-39	1	19,512	21,000	7.6
40-44	4	78,048	84,000	7.6
45-49	1	19,512	21,000	7.6
50-54	4	78,048	84,000	7.6
55-59	<u>1</u>	<u>19,512</u>	<u>21,000</u>	7.6
TOTALS	20	\$390,240	\$420,000	7.6%

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	1	0
4	0	1
5 or more	20	19

Average Age: 40.8 years.

Average Service: 11.7 years.

CRYSTAL POLICE 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>
25-29	2	0.1		*		*
30-34		0.1		*		*
35-39				*		*
40-44		0.1		*		*
45-49	—	—	<u>1</u>	<u>0.1</u>	—	<u>0.1</u>
TOTALS	2	0.3	1	0.1	0	0.1

* Less than 0.1%

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

Average age at separation: 28.0 years.

Average service at separation: 3.1 years.

CRYSTAL POLICE RELIEF ASSOCIATION

Schedule 3(B)

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

<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>
25-29	1	0.1				
30-34		0.1				
50-54	—	—	—	0.1	—	0.1
TOTALS	1	0.2	0	0.1	0	0.1

* Less than 0.1%

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

Average age at separation: 26.0 years.

Average service at separation: 5.3 years.

CRYSTAL POLICE RELIEF ASSOCIATION

Schedule 4

Separations From Active Service
For Age & Service Retirement

Age at Termination	1979		1980	
	<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.

CRYSTAL POLICE RELIEF ASSOCIATION

Schedule 5

Death After Retirement
(Disability and Service Retirants)

<u>Age at Death</u>	<u>1979</u>		<u>1980</u>	
	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>
45-49		0.0053		0.0059
50-54		0.0181		0.0201
55-59		0.0375		0.0406
60-64		0.0496		0.0538
65-69	—	<u>0.0327</u>	—	<u>0.0352</u>
TOTALS	0	0.1432	0	0.1556

Average age at death: N/A.

Comments

Miscellaneous losses

The miscellaneous loss shown under active members for both 1979 and 1980 are attributable to problems in the asset information supplied.

APPENDICES

CRYSTAL POLICE 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		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 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

<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

Crystal Police 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, 36/80 of base pay at retirement. For each year in excess of 20, an additional 1/80 is added, up to a maximum of 43/80 of base pay for 27 or more years of service.

Pay Used For Plan Purposes. For benefit determination purposes "base pay" means the salary of a first grade patrolman for the second month of the previous fiscal year. For contribution purposes it means the present pay of a first grade patrolman.

Disability Retirement

Eligibility. Disabled to the extent that no longer able to perform the duties of a police officer before being eligible for age & service retirement.

Amount. 36/80 of base pay at time of disability. If service exceeds 21 years, the amount is recomputed as an age & service benefit at the time the retirant reaches age 50.

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

Eligibility.

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

Child. Younger than age 18.

Amount.

Spouse. 19/80 of base pay at separation from service.

Child. 6/80 of base pay per child. Children's maximum is 18/80 if spouse is receiving and 36/80 if no spouse is receiving.

Vested Deferred. 20 years of service and separated before age 50. Maximum benefit is 40/80 of base pay. Payment beginning is deferred to attainment of age 50.

Post Retirement Adjustments ("Escalator"). Each time base pay is changed, 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 payable upon separation from service.