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

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ACTUARIES & CONSULTANTS

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Detroit, Michigan 48226  
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June 2, 1981

City of Crookston  
Police Relief Association  
Crookston, Minnesota

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

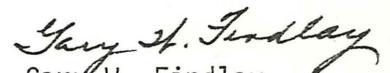
The composite results of this study are reported on Schedules 1(A) and 1(B) and comments regarding the results are on page 12.

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

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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 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.

CROOKSTON POLICE 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</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>
	<u>(\$ in 1,000)</u>		<u>(\$ in 1,000)</u>	
<u>Age &amp; Service Retirements</u>	\$ 0	\$ N/A	N/A	\$ 0
<u>Disability &amp; Death-in-Service</u>				
a. <u>Disability</u>	(0.65)	N/A	N/A	(0.03)
b. <u>Death-in Service</u>	0.18	N/A	N/A	0.01
<u>Withdrawal</u>	1.65	N/A	N/A	0.08
<u>Salary Increases</u>	45.62	0	N/A	2.23
<u>Investment Income</u>	(2.33)	(5.98)	N/A	(0.41)
<u>Post Retirement Mortality</u>	N/A	3.21	N/A	0.16
<u>Contributions</u>	(5.25)	(4.60)	N/A	(0.48)
<u>Miscellaneous</u>	(1.43)	1.08	N/A	(0.02)
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$37.79	\$(6.29)	N/A	\$1.54
<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>\$37.79</u>	<u>\$(6.29)</u>	<u>N/A</u>	<u>\$1.54</u>

CROOKSTON 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 (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>	\$ 14.10	\$ N/A	(0.09)%	\$ 0.69
<u>Disability &amp; Death-in-Service</u>				
a. <u>Disability</u>	(0.78)	N/A	0.02	(0.04)
b. <u>Death-in Service</u>	0.59	N/A	(0.27)	0.03
<u>Withdrawal</u>	43.66	N/A	0.19	2.13
<u>Salary Increases</u>	106.61	0	N/A	5.20
<u>Investment Income</u>	(1.34)	(2.87)	N/A	(0.21)
<u>Post Retirement Mortality</u>	N/A	3.59	N/A	0.18
<u>Contributions</u>	(3.74)	(3.15)	N/A	(0.34)
<u>Miscellaneous</u>	<u>(0.28)</u>	<u>(0.16)</u>	<u>N/A</u>	<u>(0.03)</u>
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$158.40	\$(2.59)	(0.15)%	\$ 7.61
<u>Conversion to UAL Amortization</u>	N/A	N/A	N/A	9.38
<u>Change in Funding Method For Death &amp; Disability</u>	5.82	N/A	0.75	0.28
<u>Changes due to plan amendments</u>	<u>0.36</u>	<u>0</u>	<u>0.12</u>	<u>0.02</u>
TOTAL (GAIN)/LOSS DURING YEAR	<u>\$164.58</u>	<u>\$(2.59)</u>	<u>0.72 %</u>	<u>\$17.29</u>

CROOKSTON 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>
25-29	1	\$ 13,152	\$ 14,600	11.0%
30-34	3	40,284	44,921	11.5
35-39	1	13,152	14,720	11.9
40-44	4	59,367	67,297	13.4
45-49	1	13,272	14,780	11.4
50-54	2	26,664	29,680	11.3
TOTALS	12	\$165,891	\$185,998	12.1%

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	1
1	0	0
2	0	0
3	0	0
4	3	0
5 or more	9	12

Average Age: 39.6 years.

Average Service: 11.6 years.

CROOKSTON 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	2	\$ 28,789	\$ 35,772	24.3%
30-34	3	45,539	56,196	23.4
35-39	1	14,720	18,036	22.5
40-44	3	51,090	61,943	23.2
45-49	1	15,254	19,067	25.0
50-54	<u>1</u>	<u>14,840</u>	<u>18,156</u>	22.3
TOTALS	11	\$170,232	\$210,170	23.5%

Employees Active at Either Beginning or End of 1980

<u>Years Service</u>	<u>Beginning of Year</u>	<u>End of Year</u>
0	1	1
1	0	2
2	0	0
3	0	0
4	0	0
5 or more	12	10

Average Age: 37.5 years.

Average Service: 9.7 years.

CROOKSTON POLICE RELIEF ASSOCIATION

Schedule 3(A)

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

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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>
25-29						*
30-34		0.1				*
35-39						*
40-44						*
45-49						*
50-54						*
TOTALS	0	0.1	0	0.0	0	0.1

\* 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	0.1

Average age at separation: N/A.

Average service at separation: N/A.

CROOKSTON POLICE 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>
25-29						*
30-34		0.1				*
35-39						*
40-44						*
45-49						*
50-54						*
TOTALS	0	0.1	0	0.0	0	0.1

\* Less than 0.1%

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

Average age at separation: 43.0 years.

Average service at separation: 20.4 years.

CROOKSTON POLICE 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>
55	—	—	<u>1</u>	—
TOTALS	0	0.0	1	0.0

Average age at retirement during period examined: 55.0 years.

Average service at retirement during period examined: 18.4 years.

CROOKSTON 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>
55-59		0.0142		0.0296
60-64		0.0237		0.0258
65-69	—	<u>0.0379</u>	—	<u>0.0408</u>
TOTALS	0	0.0758	0	0.0962

Average age at death: N/A.

APPENDICES

CROOKSTON POLICE RELIEF ASSOCIATION

Valuation Methods and Assumptions

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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		Men	Women
	For Life		3.5% Yearly			
	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

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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

Crookston Police Relief Association

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

Age & Service Retirement

Eligibility. 10 years of service and 50 years of age.

Amount. For first 10 years of service, 25% of final salary. For each year in excess of 10, an additional 2 1/2% is added up to a maximum of 75% of final salary for 30 or more years of service.

Disability Retirement

Eligibility. Disabled to the extent that unable to perform duties of police officer before being eligible for age and service retirement.

Amount. For service up to 11 years, 25% of final salary. For each year in excess of 11, 2 1/2% is added. In addition, \$300 per year is payable for dependent child who is under age 18. Maximum benefit is 50% of final salary.

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

Eligibility.

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

Child. Younger than age 18, or age 21 if full time student.

Amount.

Spouse. 30% of final salary.

Child. 10% of final salary per child.

Maximum Family Benefit. \$5,400 per year.

Vested Deferred. 10 years of service and separated before age 50. Payment beginning is deferred to attainment of age 50.

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