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The Report of the  
GAIN/LOSS ANALYSIS OF FINANCIAL EXPERIENCE  
During calendar 1979 and 1980  
CITY OF ST. PAUL  
POLICE RELIEF ASSOCIATION  
St. Paul, Minnesota

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GABRIEL, ROEDER, SMITH & COMPANY  
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2090 First National Building  
Detroit, Michigan 48226  
Area 313: 961-3346

May 14, 1981

City of St. Paul  
Police Relief Association  
St. Paul, Minnesota

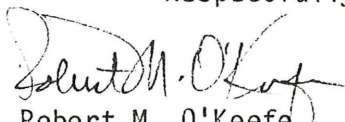
Submitted in this report are the results of the 1979-80 gain/loss analysis of the financial experiences of the St. Paul Police Relief Association.

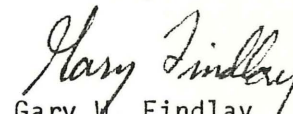
The composite results of this study are reported on Schedules 1(A) and 1(B) and comments regarding the results are on page 12.

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.



ST. PAUL 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 &amp; Service Retirements</u>	\$ 210.0	\$ N/A	(0.32)%	\$ 10.25
<u>Disability &amp; Death-in-Service</u>				
a. <u>Disability</u>	(85.7)	N/A	0.08	(4.18)
b. <u>Death-in Service</u>	(301.0)	N/A	0.29	(14.69)
<u>Withdrawal</u>	26.0	N/A	(0.01)	1.27
<u>Salary Increases</u>	1,229.3	1,025.8		110.05
<u>Investment Income</u>	0.0	(720.7)		(35.17)
<u>Post Retirement Mortality</u>	N/A	(339.8)	N/A	(16.58)
<u>Contributions</u>	51.6	117.8		8.26
<u>Miscellaneous</u>	<u>3.0</u>	<u>0.2</u>	<u>      </u>	<u>0.16</u>
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$1,133.2	\$ 83.3	0.04%	\$ 59.37
<u>Conversion to UAL Amortization</u>				817.90
<u>Changes due to plan amendments</u>	<u>1,171.9</u>	<u>0</u>	<u>0.62</u>	<u>57.19</u>
TOTAL (GAIN)/LOSS DURING YEAR	<u>\$2,305.1</u>	<u>\$ 83.3</u>	<u>0.66%</u>	<u>\$934.46</u>

ST. PAUL 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>	<u>Retirants &amp; Beneficiaries</u>	<u>Normal Cost % of Payroll</u>	<u>\$ Payment on UAL</u>
	(\$ in 1,000)		(\$ in 1,000)	
<u>Age &amp; Service Retirements</u>	\$ 317.0	\$ N/A	0.05 %	\$ 20.4
<u>Disability &amp; Death-in-Service</u>				
a. <u>Disability</u>	(102.1)	N/A	0.01	(6.6)
b. <u>Death-in Service</u>	197.9	N/A	(0.36)	12.7
<u>Withdrawal</u>	192.3	N/A	0.12	12.4
<u>Salary Increases</u>	1,812.3	1,572.9		218.2
<u>Investment Income</u>	0.0	(987.0)		(63.6)
<u>Post Retirement Mortality</u>	N/A	237.0	N/A	15.3
<u>Contributions</u>	98.9	83.5		11.7
<u>Miscellaneous</u>	<u>760.7</u>	<u>1.0</u>	<u>      </u>	<u>49.1</u>
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$3,277.0	\$ 907.4	(0.18)%	\$269.6
<u>Conversion to UAL Amortization</u>			N/A	N/A
<u>Change in Funding Method For Death &amp; Disability</u>	2,527.1	N/A	1.44	162.9
<u>Changes due to plan amendments</u>	<u>0</u>	<u>0</u>	<u>      </u>	<u>      </u>
TOTAL (GAIN)/LOSS DURING YEAR	<u>\$5,804.1</u>	<u>\$ 907.4</u>	<u>1.26 %</u>	<u>\$432.5</u>

ST. PAUL POLICE RELIEF ASSOCIATION

Schedule 2(A)

Employees Active at Both Beginning & End of 1979

Age Group Beg. Year	No.	Beginning Salary	Ending Salary	% Increase In Salary
20-24	21	\$ 435,456	\$ 469,476	7.8%
25-29	63	1,306,368	1,408,428	7.8
30-34	138	2,861,568	3,085,128	7.8
35-39	104	2,156,544	2,325,024	7.8
40-44	45	933,120	1,006,020	7.8
45-49	50	1,036,800	1,117,800	7.8
50-54	61	1,264,896	1,363,716	7.8
55-59	35	725,760	782,460	7.8
60-64	12	248,832	268,272	7.8
TOTALS	529	\$10,969,344	\$11,826,324	7.8%

Employees Active at Either Beginning or End of 1979

Years Service	Beginning of Year	End of Year
0	0	21
1	68	0
2	0	66
3	39	0
4	2	39
5 or more	445	424

Average Age: 39.3 years.

Average Service: 13.3 years.



ST. PAUL 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>
20-24	22	\$ 491,832	\$ 526,152	7.0%
25-29	56	1,251,936	1,339,296	7.0
30-34	136	3,040,416	3,252,576	7.0
35-39	115	2,570,940	2,750,340	7.0
40-44	56	1,251,936	1,339,296	7.0
45-49	43	961,308	1,028,388	7.0
50-54	47	1,050,732	1,124,052	7.0
55-59	41	916,596	980,556	7.0
60-64	<u>14</u>	<u>312,984</u>	<u>334,824</u>	7.0
TOTALS	530	\$11,848,680	\$12,675,480	7.0%

Employees Active at Either Beginning or End of 1980

<u>Years Service</u>	<u>Beginning of Year</u>	<u>End of Year</u>
0	21	0
1	0	40
2	66	0
3	0	66
4	39	0
5 or more	424	444

Average Age: 39.4 years.

Average Service: 13.4 years.

ST. PAUL 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>
20-24		0.4		*		
25-29	2	1.4		*		0.1
30-34	1	2.6		0.1		0.2
35-39	1	1.5		0.1		0.3
40-44		0.5		0.1		0.2
45-49		0.1		0.2		0.3
50-54				0.5		0.9
55-59				0.3		0.6
60-64	—	—	—	—	—	<u>0.7</u>
TOTALS	4	6.5	0	1.3	0	3.3

\* Less than 0.1%

<u>Years Service at Termination</u>	<u>Actual</u>	<u>Expected</u>
0		0.5
1	2	1.1
2		
3		0.8
4		
5 of more	<u>2</u>	<u>4.1</u>
TOTALS	4	6.5

Average age at separation: 32.0 years.

Average service at separation: 5.1 years.

ST. PAUL 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>
20-24	1	0.4				
25-29		1.4				0.1
30-34	1	2.4		0.1		0.2
35-39	1	1.5		0.2		0.3
40-44		0.6		0.1		0.2
45-49		0.1		0.2	1	0.3
50-54				0.3		0.5
55-59				0.5		0.7
60-64	—	—	—	—	—	0.6
TOTALS	3	6.4	0	1.4	1	2.9

\* Less than 0.1%

<u>Years Service at Termination</u>	<u>Actual</u>	<u>Expected</u>
0		0.5
1	1	0.4
2		1.0
3		---
4		0.8
5 of more	<u>2</u>	<u>3.7</u>
TOTALS	3	6.4

Average age at separation: 31.7 years.

Average service at separation: 5.8 years.

ST. PAUL 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>
50	2			
51			1	
52	2		3	
53	2			
54	1		1	
55	3		3	
56	1		1	
57	2			
58	1	4.0		2.0
59		8.0	1	7.0
60		3.0	1	8.0
61		3.0	1	3.0
62	2	6.0	1	3.0
63		1.0		4.0
64	2	3.0	1	1.0
65 & Over	<u>3</u>	<u>3.0</u>	<u>1</u>	<u>1.0</u>
TOTALS	21	31.0	15	29.0

Average age at retirement during period examined: 57.9 years.

Average service at retirement during period examined: 28.9 years.

ST. PAUL 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		0.0235		0.0162
50-54	1	0.3516		0.3446
55-59	2	0.5225	1	0.6538
60-64		1.1428		0.9862
65-69	1	1.3467		1.7352
70-74		1.8472	1	1.6497
75-79	1	1.3998		1.7921
80-84	1	0.8221	2	0.7087
85-89	—	<u>0.7969</u>	<u>1</u>	<u>0.8598</u>
TOTALS	6	8.2531	5	8.7463

Average age at death: 70.0 years.



### Comments

#### Miscellaneous loss, 1980

The loss shown under active members is attributable to an understatement of the liability for active members whose attained age was greater than the assumed retirement age.

## APPENDICES

# ST. PAUL 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

St. Paul 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, 40/100 of base pay. For each year in excess of 20 an additional 2/100 is added to a maximum of 50/100 of base pay 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 adjustment provisions.)

Pay Used For Plan Purposes. "Base pay" means the salary of patrolman.

Disability Retirement

Eligibility. Permanently disabled to the extent that no longer able to perform the duties of a police officer before being eligible for regular retirement.

Amount.

Duty Disability. 40/100 of base pay.

Non-Duty Disability. 10 years of service required. For first 10 years, 20/100 of base pay. For each year in excess of 10 an additional 2/100 is added up to a maximum of 40/100 for 20 years of service.

For either duty or non-duty, the benefit will be recomputed at age 50 if actual service would result in a benefit greater than 40/100 of base pay.

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

Eligibility.

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

Child. Younger than age 18 or, if full time student, younger than 23.

Amount.

Spouse. 20/100 of base pay.

Child. 5/100 of base pay per child.



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

Post Retirement Adjustment ("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. Non-refundable.