

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

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GABRIEL, ROEDER, SMITH & COMPANY

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City of St. Paul
Fire Department Relief Association
St. Paul, Minnesota

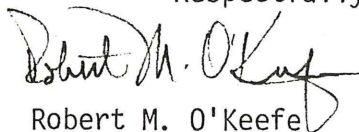
Submitted in this report are the results of the 1979-80 gain/loss analysis of the financial experiences of the City of St. Paul Fire Department Relief Association.

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

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.

ST. PAUL FIRE DEPARTMENT 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>	\$ 837.1	\$ N/A	(0.31)%	\$ 40.85
<u>Disability & Death-in-Service</u>				
a. <u>Disability</u>	39.8	N/A	(0.21)	1.94
b. <u>Death-in Service</u>	(362.4)	N/A	0.14	(17.68)
<u>Withdrawal</u>	94.1	N/A	0.00	4.59
<u>Salary Increases</u>	1,695.4	3,270.6		242.34
<u>Investment Income</u>	0	(468.6)		(22.87)
<u>Post Retirement Mortality</u>	N/A	345.5	N/A	16.86
<u>Contributions</u>	(73.2)	(193.6)		(13.02)
<u>Miscellaneous</u>	<u>13.8</u>	<u>18.3</u>	<u> </u>	<u>1.57</u>
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$2,244.6	\$2,972.2	(0.38)%	\$ 254.58
<u>Conversion to UAL Amortization</u>				787.62
<u>Changes due to plan amendments</u>	<u>1,492.3</u>	<u> </u>	<u>0.64</u>	<u>72.82</u>
TOTAL (GAIN)/LOSS DURING YEAR	<u>\$3,736.9</u>	<u>\$2,972.2</u>	<u>0.26 %</u>	<u>\$1,115.02</u>

ST. PAUL FIRE DEPARTMENT 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	Retirants &	Normal Cost	\$ Payment
	Members	Beneficiaries	% of Payroll	on UAL
	(\$ in 1,000)		(\$ in 1,000)	
<u>Age & Service Retirements</u>	\$1,021.9	\$ N/A	0.05 %	\$ 65.86
<u>Disability & Death-in-Service</u>				
a. <u>Disability</u>	(169.9)	N/A	(0.03)	(10.95)
b. <u>Death-in Service</u>	(564.2)	N/A	(0.38)	(36.36)
<u>Withdrawal</u>	(14.3)	N/A	0.09	(0.92)
<u>Salary Increases</u>	1,666.1	1,594.3		210.12
<u>Investment Income</u>	0	(1,485.0)		(95.70)
<u>Post Retirement Mortality</u>	N/A	531.5	N/A	34.25
<u>Contributions</u>	126.1	198.3		20.91
<u>Miscellaneous</u>	696.6	(9.0)		44.31
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$2,762.3	\$ 830.1	(0.27)%	\$231.52
<u>Conversion to UAL Amortization</u>			N/A	N/A
<u>Change in Funding Method For Death & Disability</u>	2,477.0	N/A	1.14	159.63
<u>Changes due to plan amendments</u>				
TOTAL (GAIN)/LOSS DURING YEAR	<u>\$5,239.2</u>	<u>\$ 830.1</u>	<u>0.87%</u>	<u>\$391.15</u>

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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	5	\$ 103,680	\$ 111,765	7.8%
25-29	55	1,140,480	1,229,415	7.8
30-34	73	1,513,728	1,631,769	7.8
35-39	53	1,099,008	1,184,709	7.8
40-44	39	808,704	871,767	7.8
45-49	57	1,181,952	1,274,121	7.8
50-54	87	1,804,032	1,944,711	7.8
55-59	34	705,024	760,002	7.8
60-64	20	414,720	447,060	7.8
64-69	1	20,736	22,353	7.8
75-79	<u>1</u>	<u>20,736</u>	<u>22,353</u>	7.8
TOTALS	425	\$8,812,800	\$9,500,025	7.8%

Employees Active at Either Beginning or End of 1979

<u>Years Service</u>	<u>Beginning of Year</u>	<u>End of Year</u>
0	1	8
1	3	46
2	14	3
3	18	14
4	41	18
5 or more	369	389

Average Age: 41.7 years.

Average Service: 15.0 years.

ST. PAUL 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>
20-24	20	\$ 447,060	\$ 478,360	7.0%
25-29	64	1,430,592	1,530,752	7.0
30-34	77	1,721,181	1,841,686	7.0
35-39	55	1,229,415	1,315,490	7.0
40-44	45	1,005,885	1,076,310	7.0
45-49	56	1,251,768	1,339,408	7.0
50-54	78	1,743,534	1,865,604	7.0
55-59	34	760,002	813,212	7.0
60-64	18	402,354	430,524	7.0
65-69	2	44,706	47,836	7.0
75-79	<u>1</u>	<u>22,353</u>	<u>23,918</u>	7.0
TOTALS	450	\$10,058,850	\$10,763,100	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	8	0
1	46	23
2	3	46
3	14	3
4	18	14
5 or more	390	379

Average Age: 41.6 years.

Average Service: 14.9 years.

ST. PAUL 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>
25-29		1.2				0.1
30-34		1.4	1	0.1		0.1
35-39		0.7		0.1		0.1
40-44		0.3		0.1		0.2
45-49		0.2		0.2		0.4
50-54				0.6		1.1
55-59				0.4		0.7
60-64						0.8
70 & Up	—	—	—	—	—	<u>0.1</u>
TOTALS	0	3.8	1	1.5	0	3.6

* Less than 0.1%

<u>Years Service at Termination</u>	<u>Actual</u>	<u>Expected</u>
0		
1		0.1
2		0.3
3		1.2
4		
5 or more	—	<u>2.2</u>
TOTALS	0	3.8

Average age at separation: N/A.

Average service at separation: N/A.

ST. PAUL FIRE DEPARTMENT 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		0.4		*		*
25-29		1.4		*		0.1
30-34	2	1.6		0.1		0.1
35-39	2	0.8		0.1		0.1
40-44		0.4		0.1		0.2
45-49		0.2		0.2		0.4
50-54				0.5		1.0
55-59				0.5	1	0.7
60-64					1	0.8
65 & over	—	—	—	—	—	0.2
TOTALS	4	4.8	0	1.5	2	3.6

* Less than 0.1%

<u>Years Service at Termination</u>	<u>Actual</u>	<u>Expected</u>
0		1.3
1		
2		0.1
3		0.3
4		1.1
5 or more	—	2.0
TOTALS	0	4.8

Average age at separation: 35.0 years.

Average service at separation: 7.5 years.

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Schedule 4

Separations From Active Service
For Age & Service Retirement

<u>Age at Termination</u>	<u>1979</u>		<u>1980</u>	
	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>
50			3	
51	1		3	
52	5		1	
53	1		2	
54	1			
55	2		3	
57			1	
58	2			
59	1		1	
60	1	2.0	3	5.0
61	2	9.0		3.0
62	1	7.0		7.0
63		2.0	2	6.0
64	3	7.0	2	2.0
65 & Over	—	<u>2.0</u>	<u>2</u>	<u>6.0</u>
TOTALS	20	29.0	23	29.0

Average age at retirement during period examined: 57.1 years.

Average service at retirement during period examined: 27.5 years.

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Schedule 5

Death After Retirement
(Disability and Service Retirants)

Age at Death	1979		1980	
	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>
35-39		0.0020		0.0022
45-49		0.0081		
50-54	1	0.2426		0.2566
55-59		0.5151		0.5664
60-64	1	0.9541		1.1279
65-69		1.7034	1	1.7398
70-74	1	0.7370	1	1.0543
75-79		0.8692		0.8064
80-84		1.5527	1	0.8640
85-89		0.5286	4	0.8406
90-94	<u>1</u>	<u>0.2779</u>	<u>—</u>	<u>—</u>
TOTALS	4	7.3907	7	7.2582

Average age at death: 80.9 years.

Comments

Salary Loss, 1979

The loss due to salary increases for 1979 under Retirants and Beneficiaries is due to a two year increase.

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 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		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 60, 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 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, 30.9/80 of base pay. For each year in excess of 20 an additional 1.8/80 is added to a maximum of 39.9/80 of base pay for 25 or more years of service. In addition, and not subject to the maximum above, 1/2% of base pay is added for each year of service over 25. (The latter additional benefit is not subject to post retirement adjustments.)

Pay Used For Plan Purposes. "Base pay" means the salary of a first grade firefighter.

Disability Retirement

Eligibility. Disabled to the extent that unable to perform the duties of a firefighter before being eligible for age & service retirement.

Amount.

- (1) If not able to perform other work, 39.9/80 of base pay.
- (2) If able to perform only light manual labor or office work, 31.5/80 of base pay.
- (3) If able to perform other manual labor, 27/80 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 and residing with member at time of death. Benefits terminate upon remarriage.

Child. Younger than 18, or 22 if full time student.

Amount.

Spouse. 21.9/80 of base pay.

Child. 7.9/80 of base pay.

Maximum Family Benefit. 46/80 of base pay.

Vested Deferred. 20 years of service and separated before age 50. 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 changed simultaneously by the same percent that base pay is changed.

Member Contributions. 8% of base pay. Non-refundable.