

The Report of the  
GAIN/LOSS ANALYSIS OF FINANCIAL EXPERIENCE  
During calendar 1979 and 1980  
CITY OF SOUTH ST. PAUL  
POLICEMEN'S BENEFIT ASSOCIATION  
South St. Paul, Minnesota

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GABRIEL, ROEDER, SMITH & COMPANY  
ACTUARIES & CONSULTANTS

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Detroit, Michigan 48226  
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August 11, 1981

City of South St. Paul  
Policemen's Benefit Association  
South St. Paul, Minnesota

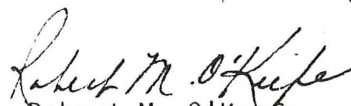
Submitted in this report are the results of the 1979-80 gain/loss analysis of the financial experiences of the South St. Paul Policemen's benefit Association.

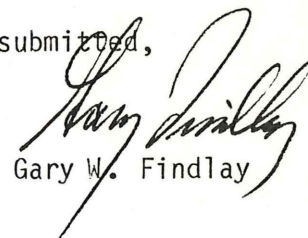
The composite results of this study are reported on Schedules 1(A) and 1(B) and comments regarding the results are on page 12.

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.

SOUTH ST. PAUL POLICEMEN'S BENEFIT 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>
	(\$ in 1,000)		(\$ in 1,000)	
<u>Age &amp; Service Retirements</u>	\$ (15.60)	\$ N/A	N/A	\$(0.76)
<u>Disability &amp; Death-in-Service</u>				
a. <u>Disability</u>	(10.18)	N/A	N/A	(0.50)
b. <u>Death-in Service</u>	(37.68)	N/A	N/A	(1.84)
<u>Withdrawal</u>	(131.45)	N/A	N/A	(6.41)
<u>Salary Increases</u>	215.04	235.13	N/A	21.97
<u>Investment Income*</u>	N/A	N/A	N/A	N/A
<u>Post Retirement Mortality</u>	N/A	43.86	N/A	2.14
<u>Contributions*</u>	N/A	N/A	N/A	N/A
<u>Miscellaneous*</u>	<u>(13.26)</u>	<u>(183.80)</u>	<u>N/A</u>	<u>(9.62)</u>
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$ 6.87	\$ 95.19	N/A	\$ 4.98
<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>\$ 6.87</u>	<u>\$ 95.19</u>	<u>N/A</u>	<u>\$ 4.98</u>

\* See comment on page 12 - "Miscellaneous Gain or Loss"

SOUTH ST. PAUL POLICEMEN'S BENEFIT 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 &amp; Service Retirements</u>	\$ 5.08	\$ N/A	0.48%	\$ 0.25
<u>Disability &amp; Death-in-Service</u>				
a. <u>Disability</u>	(10.71)	N/A	(0.06)	(0.52)
b. <u>Death-in Service</u>	4.45	N/A	0.29	0.22
<u>Withdrawal</u>	7.29	N/A	0.19	0.35
<u>Salary Increases</u>	206.13	232.96	N/A	21.42
<u>Investment Income</u>	(3.61)	(14.90)	N/A	(0.90)
<u>Post Retirement Mortality</u>	N/A	(39.13)	N/A	(1.91)
<u>Contributions*</u>	(26.03)	(43.04)	N/A	(3.37)
<u>Miscellaneous</u>	<u>(9.68)</u>	<u>(7.21)</u>	<u>N/A</u>	<u>(0.82)</u>
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$172.92	\$128.68	0.90%	\$14.72
<u>Conversion to UAL Amortization</u>	N/A	N/A	N/A	67.73
<u>Change in Funding Method For Death &amp; Disability</u>	101.68	N/A	0.27	4.96
<u>Changes due to plan amendments</u>	<u>48.67</u>	<u>N/A</u>	<u>0.42</u>	<u>2.37</u>
TOTAL (GAIN)/LOSS DURING YEAR	<u>\$323.27</u>	<u>\$128.68</u>	<u>1.59%</u>	<u>\$89.78</u>

\* See comment on page 12 - "Contributions"

SOUTH ST. PAUL POLICEMEN'S BENEFIT 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	\$ 16,344	\$ 19,908	21.8%
25-29	1	16,344	19,908	21.8
30-34	4	76,188	86,212	13.2
35-39	4	79,128	89,241	12.8
40-44	2	37,812	42,378	12.1
45-49	8	162,072	180,794	11.6
50-54	6	125,856	139,474	10.8
55-59	1	19,368	21,420	10.6
64-69	<u>1</u>	<u>21,072</u>	<u>23,446</u>	11.3
TOTALS	28	\$554,184	\$622,781	12.4

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	0
1	2	1
2	0	2
3	1	0
4	2	0
5 or more	24	25

Average Age: 45.0 years.

Average Service: 14.5 years.



SOUTH ST. PAUL POLICEMEN'S BENEFIT 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	1	\$ 19,908	\$ 23,472	17.9%
30-34	4	84,886	96,235	13.4
35-39	4	89,241	99,354	11.3
40-44	2	42,468	46,944	10.5
45-49	8	180,704	199,511	10.4
50-54	6	135,743	149,194	9.9
55-59	1	24,965	27,369	9.6
60-64	<u>1</u>	<u>21,420</u>	<u>23,472</u>	9.6
TOTALS	27	\$599,335	\$665,551	11.0

Employees Active at Either Beginning or End of 1980

<u>Years Service</u>	<u>Beginning of Year</u>	<u>End of Year</u>
0	0	0
1	1	1
2	2	1
3	0	2
4	0	0
5 or more	25	24

Average Age: 44.4 years.

Average Service: 14.1 years.

SOUTH ST. PAUL POLICEMEN'S BENEFIT 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				*		
25-29	1			*		
30-34		0.1		*		
35-39		0.1		*		
40-44				*		
45-49				*		0.1
50-54	1			*		0.1
55-59				*		
60-64	—	—	—	*	—	—
TOTALS	2	0.2	0	0.1	0	0.2

\* Less than 0.1%

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

Average age at separation: 42.0.

Average service at separation: 11.4.

SOUTH ST. PAUL POLICEMEN'S BENEFIT 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				*		*
30-34		0.1		*		*
35-39		0.1		*		*
40-44				*		*
45-49				*		0.1
50-54				*		*
55-59				*		*
60-64	—	—	—	*	—	*
TOTALS	0	0.2	0	0.1	0	0.2

\* Less than 0.1%

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

Average age at separation: N/A.

Average service at separation: N/A.

SOUTH ST. PAUL POLICEMEN'S BENEFIT 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>
59		1		
60				1
65 & Over	<u>—</u>	<u>1</u>	<u>1</u>	<u>1</u>
TOTALS	0	2	1	2

Average age at retirement during period examined: 67.0 years.

Average service at retirement during period examined: 39.2 years.



SOUTH ST. PAUL POLICEMEN'S BENEFIT 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		0.0340		0.0153
60-64		0.0540		0.0476
65-69		0.2692	1	0.2751
70-74				0.0470
80-84	—	<u>0.1026</u>	—	<u>0.1127</u>
TOTALS	0	0.4598	1	0.4977

	<u>Male</u>	<u>Female</u>
Average age at death:	66	N/A

## Comments

### Miscellaneous Gain or Loss

In 1979, the miscellaneous gain is due to lack of asset information available for analysis. Any gain or loss that occurred would otherwise be reflected in the areas of Investment Income and Contributions.

### Contributions

For 1980, the asset information provided showed total receipts of approximately \$521,000. However, the individual pieces (member and employer contributions and investment income) totaled to over \$790,000. The member contributions reported for 1980 were \$312,227, which seemed excessive. We estimated this amount to be \$43,070 and used the total receipts of \$521,000.

#### 1980 Asset Information Receipts

	<u>Reported</u>	<u>Used</u>
Member Contributions	\$312,227	\$ 43,070
Employer Contributions	375,701	375,701
Investment Income	<u>102,487</u>	<u>102,487</u>
TOTALS	\$790,415*	\$521,258

\* This sum reported as \$521,258.

## APPENDICES

# SOUTH ST. PAUL POLICEMEN'S BENEFIT 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			
	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

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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

South St. Paul Policemen's 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. 50% of base pay. For each year over 25 an additional 1/2% of base pay is added to the benefit. (The additional benefit is not subject to the post retirement adjustment provisions.)

Pay Used For Plan Purposes. "Base pay" means the prevailing base pay of rank held at retirement.

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. Same as age & service retirement.

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.

Child. Younger than age 18.

Amount.

Spouse. 25% of base pay.

Child. \$25 per month per child.

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, benefit payments are simultaneously changed by the same percent that base pay is changed. (Not applicable to children's benefits.)

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