

The Report of the
GAIN/LOSS ANALYSIS OF FINANCIAL EXPERIENCE
During calendar 1979 and 1980
CITY OF DULUTH
POLICE PENSION ASSOCIATION
Duluth, Minnesota

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GABRIEL, ROEDER, SMITH & COMPANY

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ACTUARIES & CONSULTANTS

2090 First National Building
Detroit, Michigan 48226
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July 21, 1981

City of Duluth
Police Pension Association
Duluth, Minnesota

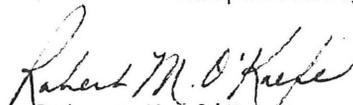
Submitted in this report are the results of the 1979-80 gain/loss analysis of the financial experiences of the Duluth Police Pension Association.

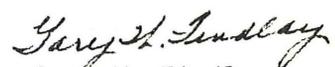
The composite results of this study are reported on Schedules 1(A) and 1(B) and comments regarding the results are on page 12.

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 casuality 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.

DULUTH POLICE PENSION 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 Members	Retirants & Beneficiaries	Normal Cost % of Payroll	\$ Payment on UAL
	(\$ in 1,000)		(\$ in 1,000)	
<u>Age & Service Retirements</u>	\$(13.0)	\$ N/A	N/A	\$(0.6)
<u>Disability & Death-in-Service</u>				
a. <u>Disability</u>	(14.6)	N/A	N/A	(0.7)
b. <u>Death-in Service</u>	(64.1)	N/A	N/A	(3.1)
<u>Withdrawal</u>	48.5	N/A	N/A	2.3
<u>Salary Increases</u>	522.1	773.2		63.2
<u>Investment Income</u>	0	(71.2)		(3.5)
<u>Post Retirement Mortality</u>	N/A	118.9	N/A	5.8
<u>Contributions</u>	4.1	8.1		0.6
<u>Miscellaneous</u>	<u>274.3</u>	<u>6.8</u>		<u>13.7</u>
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$757.3	\$835.8	N/A	\$77.7
<u>Changes due to plan amendments</u>	<u>0</u>	<u>0</u>		
TOTAL (GAIN)/LOSS DURING YEAR	<u>\$757.3</u>	<u>\$835.8</u>	<u>N/A</u>	<u>\$77.7</u>

DULUTH POLICE PENSION 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 Members	Retirants & Beneficiaries	Normal Cost % of Payroll	\$ Payment on UAL
	(\$ in 1,000)		(\$ in 1,000)	
<u>Age & Service Retirements</u>	\$ 41.1	\$ N/A	0.30%	\$ 2.0
<u>Disability & Death-in-Service</u>				
a. <u>Disability</u>	(17.5)	N/A	0.09	(0.9)
b. <u>Death-in Service</u>	(78.2)	N/A	0.73	(3.8)
<u>Withdrawal</u>	51.3	N/A	0.10	2.5
<u>Salary Increases</u>	627.1	827.7		71.0
<u>Investment Income</u>	0	(287.5)		(14.0)
<u>Post Retirement Mortality</u>	N/A	(86.3)	N/A	(4.2)
<u>Contributions</u>	141.0	258.7		19.5
<u>Miscellaneous</u>	52.3	(2.4)		2.4
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$ 817.1	\$710.2	1.22%	\$ 74.5
<u>Conversion to UAL Amortization</u>			N/A	285.2
<u>Change in Funding Method For Death & Disability</u>	438.9	N/A	0.84	21.4
<u>Changes due to plan amendments</u>	286.7	35.7	0.27	15.7
TOTAL (GAIN)/LOSS DURING YEAR	<u>\$1,542.7</u>	<u>\$745.9</u>	<u>2.33%</u>	<u>\$396.8</u>

DULUTH POLICE PENSION 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	7	\$ 131,964	\$ 143,892	9.0%
30-34	36	678,672	740,016	9.0
35-39	24	452,448	493,344	9.0
40-44	17	320,484	349,452	9.0
45-49	15	282,780	308,340	9.0
50-54	11	207,372	226,116	9.0
55-59	6	113,112	123,336	9.0
60-64	<u>4</u>	<u>75,408</u>	<u>82,224</u>	9.0
TOTALS	120	\$2,262,240	\$2,466,720	9.0%

Employees Active at Either Beginning or End of 1979

<u>Years Service</u>	<u>Beginning of Year</u>	<u>End of Year</u>
0	3	11
1	0	7
2	7	0
3	0	7
4	1	0
5 or more	112	110

Average Age: 39.3 years.

Average Service: 13.6 years.

DULUTH POLICE PENSION 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	2	\$ 41,112	\$ 44,904	9.2%
25-29	16	328,896	359,232	9.2
30-34	34	698,904	763,368	9.2
35-39	24	493,344	538,848	9.2
40-44	22	452,232	493,944	9.2
45-49	12	246,672	269,424	9.2
50-54	11	226,116	246,972	9.2
55-59	8	164,448	179,616	9.2
60-64	<u>2</u>	<u>41,112</u>	<u>44,904</u>	9.2
TOTALS	131	\$2,692,836	\$2,941,212	9.2%

Employees Active at Either Beginning or End of 1980

<u>Years Service</u>	<u>Beginning of Year</u>	<u>End of Year</u>
0	11	0
1	7	12
2	0	7
3	7	0
4	0	7
5 or more	110	107

Average Age: 39.8 years.

Average Service: 14.0 years.

DULUTH POLICE PENSION 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		0.2		*		*
30-34		0.6		*		0.1
35-39		0.3		0.1		0.1
40-44		0.2		0.1		0.1
45-49		*		0.1		0.1
50-54			1	*		0.1
55-59				*		0.1
60-64	—	—	—	*	—	*
TOTALS	0	1.3	1	0.3	0	0.7

* Less than 0.1%

<u>Years Service at Termination</u>	<u>Actual</u>	<u>Expected</u>
0		0.1
1		0.1
2		0.1
3		0.0
4		0.1
5 or more	—	0.9
TOTALS	0	1.3

Average age at separation: N/A.

Average service at separation: N/A.

DULUTH POLICE PENSION 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				*		
25-29	1	0.4		*		*
30-34		0.5		*		0.1
35-39		0.4		0.1		0.1
40-44		0.2		0.1		0.1
45-49		*		0.1		0.1
50-54		*		*		0.1
55-59			1	*		0.1
60-64	—	—	—	*	—	*
TOTALS	1	1.5	1	0.3	0	0.7

* Less than 0.1%

<u>Years Service at Termination</u>	<u>Actual</u>	<u>Expected</u>
0		0.4
1	1	0.1
2		*
3		*
4		0.0
5 or more	—	<u>1.0</u>
TOTALS	1	1.5

Average age at separation: 27.0 years.

Average service at separation: 0.7 years.

DULUTH POLICE PENSION ASSOCIATION

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>
59				2
61		1		
62	1	3	1	1
63		1	1	2
64				1
65 & Over	<u>1</u>	<u>1</u>	<u>—</u>	<u>—</u>
TOTALS	2	6	2	6

Average age at retirement during period examined: 63.5 years.

Average service at retirement during period examined: 35.75 years.

DULUTH POLICE PENSION 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>
50-54		0.0576		0.0627
55-59		0.1592	1	0.1389
60-64		0.5204	1	0.5071
65-69	1	0.4750	1	0.6066
70-74		0.3271	1	0.3522
75-79		0.2613		0.0795
80-84		0.2467	1	0.3700
85-89	<u>1</u>	<u> </u>	<u>1</u>	<u> </u>
TOTALS	2	2.0473	6	2.1170

Average age at death: 72.25 years.

Comments

Miscellaneous Loss 1979

The miscellaneous loss for 1979 under Active Members of \$294,300 is attributable to two major items. The first is a difference in the assets used for the 1978 actuarial valuation and the beginning assets for 1979. This difference was \$167,666. The second item is attributable to a correction of the benefit formula for age and service retirements. This difference was approximately \$100,524.

Miscellaneous Loss 1980

The miscellaneous loss for 1980 under Active Members of \$52,300 is attributable to differences in assets reported for the end of 1979 and the beginning of 1980. This difference was \$55,048.

APPENDICES

DULUTH POLICE PENSION 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 For Life		Increasing 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

Duluth Police Pension Association

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

Eligibility. 20 years of service and 50 years of age.

Amount. For first 20 years of service 31.8/80 of base pay. For the 21st year an additional 1/80 is added and for each year in excess of 21 an additional 2/80 is added up to a maximum of 40.8/80 of base pay for 25 or more years of service.

Pay Used For Plan Purposes. "Base pay" means the salary of a first class patrolman with 16 years of service.

Disability Retirement

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

Amount. Determined by Board. No less than 1.5/80 of base pay for each year of service and no more than 40.8/80 of base pay.

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

Eligibility.

Spouse. Legally married to member at least 1 year before separation from service and residing with member at time of death. Benefits terminate upon remarriage but may be reinstated upon termination of a subsequent marriage.

Child. Younger than age 18, or younger than age 22 if enrolled in an accredited college or vocational school.

Amount.

Spouse. 20/80 of base pay.

Child. 8/80 of base pay per child. Children's maximum is 20/80 if spouse is receiving or 40/80 if no spouse is receiving.

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 simultaneously changed by the same percent that base pay is changed.

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