

The Report of the  
GAIN/LOSS ANALYSIS OF FINANCIAL EXPERIENCE  
During calendar 1979 and 1980  
CITY OF MANKATO  
FIRE DEPARTMENT RELIEF ASSOCIATION  
Mankato, Minnesota

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GABRIEL, ROEDER, SMITH & COMPANY

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GABRIEL, ROEDER, SMITH & COMPANY

ACTUARIES & CONSULTANTS

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City of Mankato  
Fire Department Relief Association  
Mankato, Minnesota


Submitted in this report are the results of the 1979-80 gain/loss analysis of the financial experiences of the Mankato 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

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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

### 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 casualty 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.



MANKATO 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 &amp; Service Retirements</u>	\$236.13	\$ N/A	N/A	\$14.99
<u>Disability &amp; Death-in-Service</u>				
a. <u>Disability</u>	(10.24)	N/A	N/A	(0.65)
b. <u>Death-in Service</u>	(25.51)	N/A	N/A	(1.62)
<u>Withdrawal</u>	2.57	N/A	N/A	0.16
<u>Salary Increases</u>	57.81	107.47	N/A	10.49
<u>Investment Income</u>	(2.29)	(1.21)	N/A	(0.22)
<u>Post Retirement Mortality</u>	N/A	6.07	N/A	0.38
<u>Contributions</u>	17.92	32.62	N/A	3.21
<u>Miscellaneous</u>	<u>7.24</u>	<u>3.80</u>	<u>N/A</u>	<u>0.70</u>
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$283.63	\$148.75	N/A	\$27.44
<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>\$283.63</u>	<u>\$148.75</u>	<u>N/A</u>	<u>\$27.44</u>

MANKATO 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 &amp; Service Retirements</u>	\$ (7.02)	\$ N/A	(0.20)%	
<u>Disability &amp; Death-in-Service</u>				\$(0.45)
a. <u>Disability</u>	(9.86)	N/A	(0.06)	(0.64)
b. <u>Death-in Service</u>	(25.54)	N/A	0.26	(1.65)
<u>Withdrawal</u>	2.87	N/A	0.05	0.19
<u>Salary Increases</u>	112.26	125.19	N/A	15.30
<u>Investment Income</u>	(3.99)	(4.25)	N/A	(0.53)
<u>Post Retirement Mortality</u>	N/A	49.71	N/A	3.21
<u>Contributions</u>	8.25	18.08	N/A	1.70
<u>Miscellaneous</u>	<u>(0.03)</u>	<u>(0.06)</u>	<u>N/A</u>	<u>(0.01)</u>
EXPERIENCE RELATED (GAIN)/LOSS & CORRESPONDING CHANGE IN CONTRIBUTION REQUIREMENTS	\$ 76.94	\$188.67	0.05 %	\$17.12
<u>Conversion to UAL Amortization</u>	N/A	N/A	N/A	N/A
<u>Change in Funding Method For Death &amp; Disability</u>	148.17	N/A	(0.61)	9.55
<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>\$225.11</u>	<u>\$188.67</u>	<u>(0.56)%</u>	<u>\$26.67</u>

MANKATO FIRE DEPARTMENT 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>
30-34	2	\$ 31,464	\$ 33,672	7.0%
35-39	4	62,928	67,344	7.0
40-44	10	157,320	168,360	7.0
45-49	8	125,856	134,688	7.0
50-54	1	15,732	16,836	7.0
55-59	1	15,732	16,836	7.0
60-64	<u>1</u>	<u>15,732</u>	<u>16,836</u>	7.0
TOTALS	27	\$424,764	\$454,572	7.0%

Employees Active at Either Beginning or End of 1979

<u>Years Service</u>	<u>Beginning of Year</u>	<u>End of Year</u>
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5 or more	30	27

Average Age: 45.1 years.

Average Service: 18.6 years.



MANKATO 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>
30-34	1	\$ 16,836	\$ 18,432	9.5%
35-39	4	67,344	73,728	9.5
40-44	7	117,852	129,024	9.5
45-49	10	168,360	184,320	9.5
50-54	3	50,508	55,296	9.5
55-59	1	16,836	18,432	9.5
65-69	<u>1</u>	<u>16,836</u>	<u>18,432</u>	9.5
TOTALS	27	\$454,572	\$497,664	9.5%

Employees Active at Either Beginning or End of 1980

<u>Years Service</u>	<u>Beginning of Year</u>	<u>End of Year</u>
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5 or more	27	27

Average Age: 46.1 years.

Average Service: 19.6 years.

MANKATO 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>
30-34		*		*		*
35-39		0.1		*		*
40-44		*		0.1		0.1
45-49		*		*		0.1
50-54		*		*		*
55-59		*		*		*
60-64	—	*	—	*	—	*
TOTALS	0	0.1	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	—	0.2
TOTALS	0	0.2

Average age at separation: N/A.

Average service at separation: N/A.

MANKATO FIRE DEPARTMENT RELIEF ASSOCIATION

Schedule 3(B)

Separations From Active Service (Other Than Age & Service Retirement)  
During 1980

Age at Termination	Withdrawal		Disability		Death	
	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>
30-34		*		*		*
35-39		0.1		*		*
40-44		*		*		0.1
45-49		*		0.1		0.1
50-54				*		*
55-59				*		*
TOTALS	0	0.1	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	0.1

Average age at separation: N/A.

Average service at separation: N/A.

MANKATO FIRE DEPARTMENT 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>
51	2			
61	1			
64		1.0		
65 & Over	—	—	—	<u>1.0</u>
TOTALS	3	1.0	0	1.0

Average age at retirement during period examined: 54.3 years.

Average service at retirement during period examined: 24.9 years.

MANKATO FIRE DEPARTMENT RELIEF ASSOCIATION

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>
50-54		0.0201		0.0222
60-64		0.0540		0.0258
65-69	1	0.3066		0.3154
70-74		0.3905		0.3317
75-79				0.1361
85-89		0.1545		0.1667
90-94	—	—	—	—
TOTALS	1	0.9257	0	0.9979

Average age at death: 69 years.



## APPENDICES

# MANKATO 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 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 62, 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

Mankato 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.

Full Time Firemen. For first 20 years of service, 50% of base pay of first class fireman. For service in excess of 20 years an additional \$30 per year is added up to a maximum of an additional \$300 per year.

Call Firemen. \$102 per year.

Disability Retirement

Eligibility. Disabled from occupational causes to the extent that no longer able to perform duties of fireman before being eligible for regular retirement.

Amount. Full time and call firemen - 50% of base pay of first class fireman.

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. (For call firemen, benefit is payable only in the event of a duty related death.)

Child. Younger than age 18.

Amount.

Full Time.

Spouse. 60% of basic pension due member.

Child. 12 1/2% of basic pension due member per child.

Maximum Family Benefit. 80% of basic pension due member.

Call Firemen.

Spouse. 50% of earned pension due member.

Funeral Expense Payment. \$500 for full time firemen.

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 the pay of first class firemen is changed, the following benefits are changed by the same percent the first class firemen's pay is changed: Full time firemen's benefits; disability benefits for both full time and call firemen; and benefits for the surviving spouse and dependent children of full time firemen.

Member Contributions. 10.65% of pay of first class firemen. Total member contributions are refundable, without interest, if no monthly benefit is payable upon separation from service. (Contribution provisions are applicable only to full time firemen.)