CITY OF FRIDLEY VOLUNTEER FIREFIGHTERS RELIEF ASSOCIATION

Actuarial Valuation, Benefit Study
and Experience Analysis
as of January 1, 1983

August 3, 1983

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PURPOSE AND SUMMARY

The following report sets forth the results of our study for the City of Fridley Volunteer Firefighters Relief Association. The study included the following:

- Determination of annual contribution for the current plan.
- Determination of annual contribution if certain death benefits are removed from the actuarial calculations for the funding of the plan.
- Experience analysis pursuant to Chapter 356 of Minnesota State Statutes.

The results of our study are summarized in the tables of the report and discussed further herein.

EMPLOYEE DATA

Based on data provided by the Association, there are 31 active members included in the valuation. The members have an average attained age of 37.1 and an average entry age of 27.2. Table 2(a) sets forth the prospective benefit each member may expect to receive if he remains in the Association until the normal retirement date assumed in the valuation, age 55 and completion of 20 years of service.

There are sixteen inactive members entitled to benefits under the plan. Eleven retired members and one disabled member are receiving benefits from the plan. Four members are entitled to future payments upon attainment of age 50. Table 2(b) is a summary of the benefits for these members.

ASSETS

Mr. Chuck McKusick provided us with a copy of the annual financial statement prepared by the Association's accountant for the Special Fund as of January 1, 1983. Assets are valued at $941,232 on such date. We have used this value for valuation purposes. Investment return was well in excess of the 5% valuation assumption for the experience study period 1979 - 1982. The annual yield is summarized as follows:

	Investment Yield
1979	8.34%
1980	8.09%
1981	9.81%
1982	11.25%
4 Year Average	9.37%

ACTUARIAL ASSUMPTIONS AND METHOD

Table 3 is a summary of the principal plan provisions of the current plan. The last amendment effective January 1, 1983 raised the monthly benefit level from $10 to $12 per year of service.

Table 4 sets forth a summary of the actuarial assumptions used in valuing these plan provisions. With the exception of the disability assumption, we have used the same assumptions as used by the prior actuary for the 1982 actuarial valuation.

As required by law, the funding method used for the valuation is the entry age normal cost method. Under this method, the normal cost is computed as that level amount which would fund all benefits if it was contributed every year from each fireman's entry into the plan until his retirement. The total normal cost for the plan is the sum of the normal costs for all active members.

The present value of all future benefits payable from the plan for all active and inactive members less the present value of all future normal costs is defined as the accrued liability. The accrued liability is the amount that would have accumulated in the Special Fund if all the actuarial assumptions had been exactly realized in all prior years and if funding for all members, based on current plan benefits, had commenced immediately upon their date of joining the Association.

The accrued liability then is compared to the market value of the Special Fund. Any excess of accrued liability over market value, known as the unfunded accrued liability, is to be funded with a payment to be made annually for a number of years specified by law, known as the amortization payment. The unfunded accrued liability of your current plan must be amortized over 20 years and any increases in the unfunded accrued liability due to changes in the benefits or actuarial assumptions must be amortized over 20 years.

The amortization payment is added to the normal cost for the total annual contribution due as of the valuation date. Interest must be added to the contribution at the rate of 5% from the valuation date to the date of payment. Thus, if payment were made as of December 31, 1983, the January 1 contribution amount would be multiplied by 1.05.

SUMMARY OF VALUATION RESULTS

The first column of Table I sets forth a summary of the results of the valuation of the current plan. The plan provides a monthly benefit of $12 per year of service (maximum 30 years) at normal retirement, age 50 and 20 years of service. Lump sum death benefits, deferred vested benefits, disability and surviving spouse's and children's benefits are also provided.

A total contribution of $40,534 is required to fund the plan. This is slightly less than the $40,759 contribution estimated by the prior actuary to fund a $240 monthly benefit plan. The annual contribution of $40,534 is that amount of new money that must be contributed to the plan each year to keep it funded in accordance with state law. The sources of the new money are the State Aid and the city tax levy. Interest earnings in the Special Fund may not be counted toward the contribution requirements. Contributions to the Special Fund have been in excess of $55,000 for the past three years. Thus, the state requirements are being met.

CHANGE IN THE UNFUNDED ACCRUED LIABILITY

Chapter 356 requires a reconciliation of the unfunded accrued liability from one valuation to the next valuation. Based on information supplied by the Association, the prior actuary reported an unfunded liability of ($99,675) as of January 1, 1979.

As of January 1, 1983 there is an unfunded accrued liability of $160,769. The change of $260,444 is a result of the following:

1.	January 1, 1979 Unfunded Accrued Liability		$ (99,675)
2.	Decrease due to contributions 1979-1982		$ 126,778
3.	Increase due to:		
	a.	Benefit improvements	$ 336,120
	b.	Experience losses and assumption changes	$ 51,102
	c.	Total increase	$ 387,222
4.	January 1, 1983 Unfunded Accrued Liability (1. - 2. + 3.c.)		$ 160,769

BENEFIT STUDY RESULTS

The second and third columns of Table I present the results of our benefit study for the Association. The Association is considering removing the funding of certain death benefits from the actuarial calculations. The death benefits would be funded through an insurance contract. The premium for the contract plus the contribution set forth in Table I would be the total amount required under the state statutes to fund the plan.

Plan I assumes that all benefits payable upon the death of an active member less than age 50 would be paid by an insurance policy. This includes the $1,000 lump sum funeral benefit, the $14,000 lump sum survivor death benefit and the monthly survivor benefit. Removing these benefits from the actuarial calculations reduces the contribution determined by the actuary by $2,800. Thus, if the insurance premium was less than $2,800 for these benefits there would be a cost savings to the Association.

Plan II assumes that all the benefits described under Plan I have been removed from the actuarial calculations. Additionally, benefits payable on the death of any disabled or terminated vested member prior to age 50 would be paid from an insurance policy. Once the disabled or terminated vested member has attained age 50, all benefits are payable from the assets of the Special Fund.

For example, if a member terminates at age 45 entitled to a deferred benefit and dies while married at age 48, the surviving spouse would receive her monthly benefits from an insurance company for her remaining lifetime. If the same member died after his monthly benefit payments had commenced at age 50, the spouse would receive her monthly benefits from the Special Fund assets.

This type of provision reduces the contribution determined by the actuary by $3,000 from the current funding requirement. Thus, if the insurance premium was less than $3,000 for these benefits there would be a cost savings to the Association.

EXPERIENCE ANALYSIS

Chapter 356 of the Minnesota Statutes requires that an experience study be performed to test the appropriateness of the actuarial assumptions which are utilized in the actuarial valuation in conjunction with the 5% interest assumption. The purpose of our experience study is to fulfill the state requirements. The participant data was provided on listings by the Association. The data was furnished as of December 31, 1982.

Active Members

As of January 1, 1979 there were 38 active members in the Association. As of December 31, 1982 that number had decreased by 7 to 31. The following table tracks the active membership during that time period.

		1979	1980	1981	1982
1.	Number of active members as of January 1	38	37	36	34
2.	Separation from active				
	a. Retirements	3	1	1	--
	b. Deaths	--	--	--	--
	c. Terminations - Non-Vested	1	2	--	1
	d. Terminations - Vested	2	2	1	2
	e. Total	6	5	2	3
3.	New entrants during year	5	4	0	0
4.	Number of active members as of December 31 (1 - 2.e + 3)	37	36	34	31

As of December 31, 1982 the average attained age for those 31 active members was 37.1 and the average entry age was 27.2. During the period the new entrants had average entry ages that may be summarized as follows:

NEW ENTRANTS

Year	Number	Average Entry Age
1979	5	27.2
1980	4	23.3
1981	--	--
1982	--	--

As a test of the appropriateness of the actuarial assumptions used for the actuarial valuation, a comparison is made between the actual number of separations from the plan and the number of expected separations if the actuarial assumptions were exactly realized. The ratio of the actual to expected experience (A/E) is an indicator of the deviation of the group from the assumptions used. A ratio greater than 1.00 for deaths and terminations would tend to decrease the cost of the plan. A ratio of less than 1.00 indicates there were fewer separations than expected and would tend to increase plan costs. The reverse analysis is true for retirements and disability.

For active lives, this analysis is performed for separations from active service due to retirement, death, and termination of membership and disability. The results are summarized in the following table.

SEPARATIONS FROM ACTIVE SERVICE

		Actual	Expected	A/E
1.	Retirements	5	3.00	1.67
2.	Deaths	0	.30	0.00
3.	Terminations	11	3.39	3.24
4.	Disability	0	1.08	0.00

Table 4 is a summary of the actuarial assumptions used as the basis for the expected number of separations. With the exception of the disability assumption, these are the same assumptions used by the prior actuary as of January 1, 1979.

Inactive Members

As of January 1, 1979 there were 9 members on the inactive rolls of the Association. Seven retired members and one disabled member were receiving benefits from the plan. One vested member was entitled to future payments upon attainment of age 50. By December 31, 1982 the number of retired members had increased by 4 to 11 and the number of vested members had increased by 3 to 4. There were no new disabled members. During that period the inactive membership increased as shown below.

INACTIVE MEMBERS

		1979	1980	1981	1982
1.	Number of inactive members as of January 1				
	a. Retired	7	10	10	11
	b. Disabled	1	1	1	1
	c. Deferred	1	2	2	2
	d. Total	9	13	13	14
2.	Deaths during year	--	--	--	--
3.	Paid lump sum benefit	1	3	1	--
4.	Change in status - deferred to retired	--	--	--	--

	1979	1980	1981	1982
5. Additions during year				
a. Retired	3	1	1	--
b. Disabled	--	--	--	--
c. Deferred	2	2	1	2
d. Total	5	3	2	2
6. Number of inactive members as of December 31 (1.d - 2 - 3 + 5.d)	13	13	14	16

There are no surviving spouses or children presently entitled to benefits under the plan.

The seven retired members as of January 1, 1979 received monthly benefits on the $8 level totalling $1,133. The eleven retired members now receive monthly payments on the $12 level totalling $2,692. The disabled member is receiving $197 per month.

The eleven retired members have an average attained age of 62.9. The disabled member is age 50.3. The four vested members have an average attained age of 44.5. Of the eleven retired members as of December 31, 1982, all retired on or after their normal retirement date of age 50 and 20 years of service. They had an average retirement age of 55.6. During the experience period the average retirement age is summarized as follows:

Year	Number of Retirees	Average Retirement Age
1979	3	51.8
1980	1	54.9
1981	1	54.6
1982	0	--

An analysis of the actual to expected experience (based on the mortality assumption set forth in the Appendix) produces the following results.

INACTIVE MEMBERS

1.	Actual deaths	0.00
2.	Expected deaths	.74
3.	A/E	0.00

Recommendations

Although the possibility for annual fluctuations in a group this size limits the statistical credibility of such a study, we feel the following trends should be noted:

1. The retirement age assumption of 55 and 20 years of service is greater than the earliest age, 50 and 20 years that benefits are available under the plan. The assumption however, does coordinate very well with the actual experience under the plan and we recommend no changes in this regard.
2. Actual turnover experience has exceeded that predicted by application of the actuarial assumptions. Use of a turnover assumption which underestimates actual turnover experience introduces a degree of conservativeness or an extra safety margin into the actuarial valuation.

We feel that the actuarial assumptions in the aggregate, are appropriate for use with this plan.

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If in connection with this study any additional work is required we will be happy to proceed as directed.

Respectfully submitted,

THE WYATT COMPANY

Victoria A. Suchsland

Victoria A. Suchsland
Fellow, Society of Actuaries

VAS/pak
August 3, 1983

Table I

CITY OF FRIDLEY VOLUNTEER FIREFIGHTERS RELIEF ASSOCIATION

Results of Actuarial Valuation of Current and Proposed Plans as of January 1, 1983 1/

		Current Plan (1)	Plan I (2)	Plan II (3)
1.	Accrued Liability			
	a. Active Members	520,835	500,757	499,998
	b. Retired and Disabled Members	503,749	503,749	503,749
	c. Terminated Members Entitled to Deferred Benefits	77,417	77,417	75,637
	d. Total	1,102,001	1,081,923	1,079,384
2.	Valuation Assets	941,232	941,232	941,232
3.	Unfunded Accrued Liability (1 - 2)	160,769	140,691	138,152
4.	Amortization Payment for Unfunded Accrued Liability	12,286	10,752	10,558
5.	Annual Normal Cost	26,318	25,209	25,155
6.	Annual Contribution Payable as of January 1, 1983 (4 + 5)	38,604	35,961	35,713
7.	Annual Contribution Payable as of December 31, 1983 (6 x 1.05)	40,534	37,759	37,499

1/ Summary of current provisions is contained in Table I. Plan I would remove the funding of all benefits (lump sum and monthly) payable from the Special Fund upon the death of an active member prior to age 50 from the actuarial valuation. Plan II would remove the benefits as done in Plan I plus remove the funding of all benefits (lump sum and monthly) payable from the Special Fund upon the death of a disabled or terminated vested member prior to age 50. The death benefits that would be removed from the actuarial calculations would be provided under an insurance contract.

Table 2(a)

CITY OF FRIDLEY VOLUNTEER FIREFIGHTERS RELIEF ASSOCIATION

Projected Benefits for Active Members as of January 1, 1983 1/

Name		Birth Date	Entry Date	Projected Annual Benefit
ALDRICH	RB	7/54	1/78	4320.00
ALDRICH	RD	12/26	8/58	3504.00
BAKKE	DR	2/42	11/66	4320.00
COPPICUS	C	6/51	1/78	4092.00
GERRETY	CT	6/54	1/81	4092.00
HAMER	L	11/35	3/70	2976.00
HIGGINS	J	3/37	7/68	3408.00
JOHNSON	H	6/47	1/78	3516.00
KELLY	T	3/33	2/56	4320.00
KREMER	R	1/36	11/63	3912.00
LARSON	G	10/39	10/65	4176.00
LARSON	R	1/42	4/70	3852.00
LARSON	T	10/45	9/79	3036.00
LENZ	D	4/43	11/73	3516.00
MCKUSICK	C	1/42	12/68	4044.00
MESSER	R	3/46	6/63	4320.00
MONEY	R	12/45	11/73	3900.00
OMLIE	KR	11/58	1/81	4320.00
OTTEM	D	8/35	5/64	3780.00
PEKA	B	7/55	9/79	4320.00
PETERS	M	11/50	1/78	4008.00
PETERSON	C	9/56	9/79	4320.00
SABA	S	5/54	9/79	4272.00
SAEFKE	J	4/49	10/73	4320.00
SCHONEMAN	R	3/41	3/70	3744.00
SIMONSON	H	12/39	1/66	4164.00
SKIRKA	D	4/47	1/78	3492.00
STIXRUD III	RL	1/59	1/81	4320.00
SWANSON	K	3/59	1/81	4320.00
TOLLEFSON	J	11/46	1/78	3432.00
TROCKE	R	6/41	2/72	3504.00

1/ Assumes retirement upon attainment of age 55 and completion of 20 years of service.

Table 2(b)

CITY OF FRIDLEY VOLUNTEER FIREFIGHTERS RELIEF ASSOCIATION

Monthly Benefits for Inactive Members as of January 1, 1983

NAME	TYPE	MONTHLY BENEFITS
Anderson	Disabled	$ 196.80
Chesney	Retired	240.00
Ellis	Retired	240.00
Hughs	Retired	244.00
Lundgren	Retired	244.00
Paulson	Retired	240.00
Sachs	Retired	271.00
Viegar	Retired	240.00
Froom	Def Vested	85.79
Longerbone	Retired	240.00
Olson	Retired	253.00
Peka	Retired	240.00
Sandin	Retired	240.00
Kasick	Def Vested	240.00
Haley	Lump Sum	12,000.00
Lorbeski	Lump Sum	12,000.00

Table 3

CITY OF FRIDLEY VOLUNTEER FIREFIGHTERS RELIEF ASSOCIATION

Summary of Current Plan Provisions

1.	Normal Retirement Benefit:	Monthly benefit of $12 per month per year of service payable on retirement after attainment of age 50 and completion of 20 years of service. No credit granted for more than 30 years of service.
2.	Deferred Vested Benefit:	On termination after completion of 10 years of service, a deferred benefit is payable at age 50 equal to the accrued normal retirement benefit times the vesting percentage. The vesting percentage is 60% after 10 years plus 4% per year in excess of 10 to a maximum of 100% after 20 years.
3.	Disability Benefit:	Upon permanent disability a member with 10 or more years of service is entitled to the vested accrued normal retirement benefit. Benefit payments commence immediately if disability occurred in the line of duty. Otherwise payments commence upon attainment of age 50.
4.	Lump Sum Death Benefit:	$1,000 payable on death of any active or inactive member at discretion of the Board.
5.	Survivor's Benefit:	On death of any active member with 10 or more years of service or inactive member, the vested accrued normal retirement benefit is payable to the surviving spouse or children. Benefits cease upon remarriage of the spouse or the child's attainment of age 18. On death of any active member with less than 10 years, $14,400 is payable to the survivors.
6.	Optional Form of Payment:	In lieu of the monthly retirement benefit a member may elect a lump sum payment as settlement of all rights under the plan.

Table 4

CITY OF FRIDLEY VOLUNTEER FIREFIGHTERS RELIEF ASSOCIATION

Actuarial Assumptions and Method

1. Mortality: 1971 Group Annuity Mortality Table. This table used for all rates of mortality.

2. Withdrawal: The rate of withdrawal is .070 at age 20 decreasing uniformly to zero at age 45 with no withdrawal after that age.

3. Disability: The Railroad Retirement Board 12th Valuation rates of disablement, loaded for the size and nature of the group. 25% of the disabilities were assumed to be in the line of duty or service related.

4. Retirement Age: Members are assumed to retire after attaining age 55 and completing 20 years of service.

5. Interest Rate: Five percent compounded annually.

6. Actuarial Cost Method: The entry age normal cost method has been used with the normal cost determined as a level amount each year from the date of joining the Association to the assumed retirement age.