

**Columbia Heights
Fire Department Relief Association
Volunteer Division
Annual Actuarial Valuation
December 31, 1986**

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Appendix I Meaning of Unfunded Accrued Liabilities

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May 11, 1987

Board of Trustees
Columbia Heights Fire Department Relief Association (Volunteer Division)
Columbia Heights, Minnesota

Submitted in this report are the results of the December 31, 1986 actuarial valuation of the assets, actuarial values and contribution requirements associated with the benefits provided by the Columbia Heights Fire Department Relief Association Volunteer Division.

The valuation results contained in Section A provide the actuarial information needed to determine the employer's "minimum obligation" effective January 1, 1988. Section A also contains comments regarding the valuation results.

The valuation was based upon information furnished by the Association concerning benefits, financial transactions, active members, terminated members, retirants and beneficiaries. Data was checked for year to year consistency but was not otherwise audited by us. This information is summarized in Section B.

A description of the actuarial funding method and the risk experience assumptions used is contained in Section C. The economic risk experience assumptions, as well as the actuarial funding method to be used, are established by state law.

Information needed to comply with Statement No. 5 of the Governmental Accounting Standards Board is contained in Section D.

The actuarial valuation was prepared using generally accepted actuarial principles and practices based upon the methods, assumptions, summary of plan provisions and the member and financial data described in this report.

Respectfully submitted,


Ronald W. Smith


Gary V. Findlay

Section A

Valuation Results

COMMENTS

Economic Assumptions and Financing Method

The economic assumption of 5% annual investment return is established by state law. State law also specifies that the annual minimum obligation of the municipality shall be determined by adding (i) the employer normal cost to (ii) the level dollar amount required to amortize the unfunded actuarial accrued liability by December 31, 2010.

It is worth noting that when the same assumptions and methods are applied to plans which differ in nature, the valuation results may not be comparable. Caution should be exercised when attempting to assess the financial condition of one Association relative to another on the basis of valuation results produced using the assumptions and methods mandated by state law.

Overfunded Condition of Plan

This year, as in the past several years, plan assets substantially exceed actuarial accrued liabilities. It is our understanding that this situation is in large part due to the asset allocation procedure followed at the time that the volunteer plan separated from the plan for paid firefighters.

The plan surplus of \$272,353 results in a computed annual credit of \$19,703 through the year 2010. With a computed normal cost of \$13,247 the computed net contribution rate amounts to a negative \$6,456. However, the state guidelines act makes no provision for dealing with surplus assets in volunteer plans which have recurring benefit payments. Consequently, the legally mandated contribution is the normal cost of \$13,247.

Rather than continue to overfund the plan, it would be advisable to contact the staff of the Legislative Commission on Pensions and Retirement to discuss the possibility of a special law to deal with this unusual situation.

Columbia Heights Fire Department Relief Association (Volunteer Division)

CONTRIBUTION RATE TO PROVIDE BENEFITS

Member portion & Employer portion
Effective January 1, 1988

<u>Contributions for</u>	<u>If Paid Equally Throughout Year</u> <u>Dollars</u>
Normal cost of annuities:	
Age & service: to members	\$ 8,724
Age & service: to survivors	1,275
Disability	1,832
Death before retirement	1,416
Refunds of member contributions	0
Total Normal Cost	\$13,247
Amortization of unfunded actuarial accrued liabilities (UAAL) (23 year level dollar payment)	
Retired lives	\$ 0
Active members	0
Total	0
Total Cost of Benefits	\$13,247
Member contributions	0
COMPUTED EMPLOYER RATE:	
(a) If Paid Equally Throughout Year	\$13,247
(b) IF PAID AT CALENDAR YEAR END	\$13,574

Columbia Heights Fire Department Relief Association (Volunteer Division)

Present Actuarial Condition

The Association's accrued actuarial assets were in excess of \$660 thousand on December 31, 1986 -- a considerable sum of money if unencumbered and allocated among a small group of persons. This is not the case with the Association's assets.

The following schedule puts the \$660 thousand into perspective by showing the relationship between accrued actuarial assets, actuarial accrued liabilities, and the number of persons with actual and potential claims on the Association's assets.

	<u>Accrued Actuarial Assets</u>	<u>Actuarial Accrued Liabilities</u>	<u>Unfunded Actuarial Accrued Liabilities</u>	<u>% Funded</u>
Retirants and Beneficiaries				
Retired Members (12)		\$271,836		
Surviving Spouses (0)		0		
Surviving Children (0)		<u>0</u>		
Total (12)	\$271,836	\$271,836	\$ 0	100.0%
Deferred Members (0)	0	0	0	
Active Members (25)	<u>388,598</u>	<u>116,245</u>	<u>(272,353)</u>	334.3
Total	\$660,434	\$388,081	\$(272,353)	170.2%

Actuarial accrued liabilities represent the value, computed as of December 31, 1986 of:

- (i) retirement allowances likely to be paid the 12 retirants and beneficiaries; and
- (ii) the contributions assumed to have been made for the 25 active members from entry into the plan until December 31, 1986.

The value of retirement allowances likely to be paid the 12 retirants and beneficiaries, discounted for investment earnings and mortality, was computed to be \$271,836 as of December 31, 1986. To put this amount in perspective, the \$271,836, together with investment earnings, will just be sufficient to pay the 12 retirants and beneficiaries their allowances for their remaining lifetimes. This assumes the 12 retirants and beneficiaries live and die according to the assumed mortality and the \$271,836 is invested to yield an average annual return of 5.0% over the remaining lifetimes of the retirants and beneficiaries.

With respect to the active members, the actuarial accrued liability of \$116,245 represents the amount that would have been accumulated by December 31, 1986. This assumes the normal cost (which is expressed as a level percentage of pay) had been contributed from the date of hire until December 31, 1986 for the 25 actives, and that these amounts had earned 5.0% interest. It also assumes that the members in the past had lived, died, withdrawn, retired and received salary increases according to the actuarial assumptions shown in this report.

Historical Funding Ratio Schedule
(\$ in thousands)

<u>Valuation Date December 31</u>	<u>Actuarial Accrued Liabilities</u>	<u>Accrued Actuarial Assets</u>	<u>Percent Funded</u>
1978	\$216	\$380	175.9%
1979	N/A	N/A	N/A
1980	277	430	155.2
1981	310	422	136.1
1982	316	506	160.1
1983	306	548	179.1
1983*	323	548	169.7
1984	N/A	N/A	N/A
1985	328	619	188.6
1986	388	660	170.2

* After change in assumptions.

Columbia Heights Fire Department Relief Association (Volunteer Division)
 Computed Contributions - Comparative Schedule

Year Ended December 31		Total Normal Cost
<u>Valuation</u>	<u>Fiscal</u>	
1978	1980	\$ 6,835
1979	1981	N/A
1980	1982	8,184
1981	1983	N/A
1982	1984	8,391
1983	1985	7,583
1983	1985*	8,210
1984	1986	N/A
1985	1987	14,110
1986	1988	13,247

* After change in assumptions.

Section B

Valuation Data and Summary of Benefit Provisions

Columbia Heights Fire Department Relief Association (Volunteer Division)

Retirants and Beneficiaries December 31, 1986

By Type of Annuity Being Paid

<u>Type of Annuity Being Paid</u>	<u>No.</u>	<u>Monthly Amounts</u>	<u>Computed Actuarial Accrued Liabilities</u>
Retirants receiving:			
Age & Service	12	\$2,194.79	\$271,836
Disability	<u>0</u>	<u> </u>	<u> </u>
Totals	12	2,194.79	271,836
Beneficiaries receiving:			
Spouse			
Child	<u>0</u>	<u>0</u>	<u>0</u>
Totals	0	0	0
	<u> </u>	<u> </u>	<u> </u>
Totals	12	\$2,194.79	\$271,836

Columbia Heights Fire Department Relief Association (Volunteer Division)

Retirants and Beneficiaries December 31, 1986

By Attained Ages

<u>Attained Ages</u>	<u>Number</u>		
	<u>Age & Service</u>	<u>Disability</u>	<u>Death Before Retirement</u>
50-54	3		
55-59	2		
60-64	1		
70-74	1		
75-79	3		
80-84	<u>2</u>	<u>—</u>	<u>—</u>
Totals	12	0	0

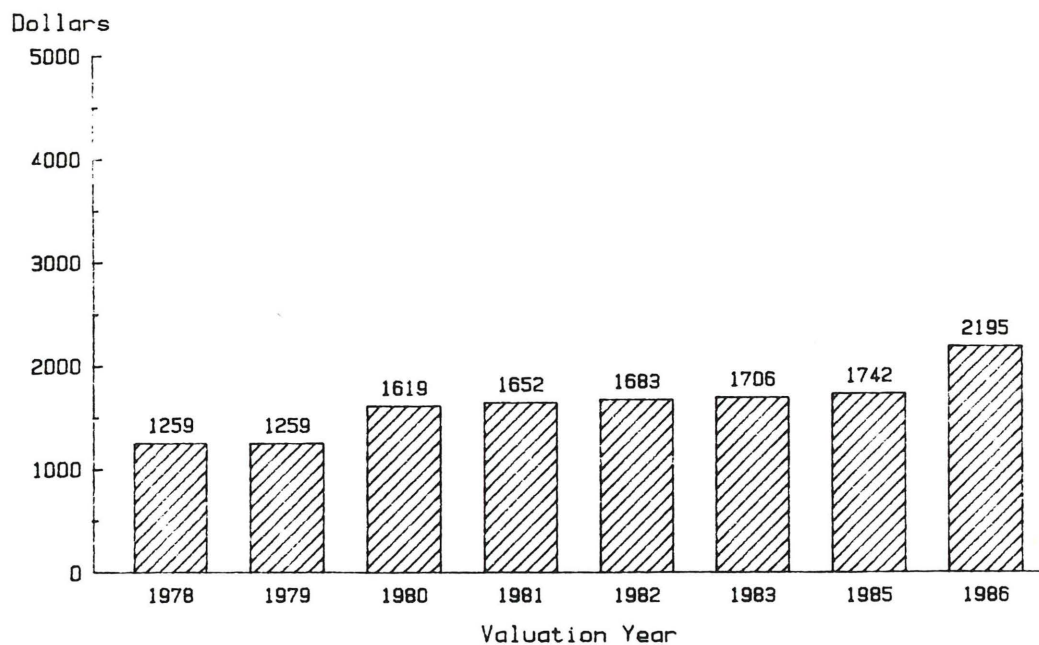
Columbia Heights Fire Department Relief Association (Volunteer Division)

Retirants and Beneficiaries Added to and Removed from Rolls

Comparative Statement

Valuation Date December 31	No. Added to Rolls	No. Removed from Rolls	Rolls End of Year		Discounted Value of Total Allowances
			No.	Annual Allowances	
1978			10	\$12,588	\$138,888
1979			10	12,588	135,468
1980			10	16,193	164,360
1981	1		11	18,173	188,024
1982	1		12	20,192	211,190
1983	1		13	22,172	245,601
1985		1	12	20,900	224,124
1986			12	26,337	271,836

Average Annual Allowances



Columbia Heights Fire Department Relief Association (Volunteer Division)

Active Members December 31, 1986

By Attained Age and Years of Service

Attained Age	Years of Service to Valuation Date							Totals
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	
20-24	6							6
25-29	4	2						6
30-34	3	2						5
35-39	1	1						2
40-44		1						1
45-49			1	2	1			4
50-54				1				1
Totals	14	6	1	3	1			25

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 32.0 years.

Service: 6.4 years.

Columbia Heights Fire Department Relief Association (Volunteer Division)

Comparative Schedule

Of Active Members

Valuation Date December 31	Active Members	Valuation Payroll	Average			
			Age	Service	Pay	% Incr.
1978	20	\$N/A	33.3 yrs.	5.8 yrs.	\$N/A	N/A%
1979	20	N/A	33.5	6.3	N/A	N/A
1980	20	N/A	34.3	7.2	N/A	N/A
1981	21	N/A	31.7	5.8	N/A	N/A
1982	22	N/A	32.1	6.3	N/A	N/A
1983	20	N/A	32.0	6.3	N/A	N/A
1985	27	N/A	30.8	5.3	N/A	N/A
1986	25	N/A	32.0	6.4	N/A	N/A

Columbia Heights Fire Department Relief Association (Volunteer Division)
Brief Summary (12/31/86) 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, \$2,472 per year. For each year in excess of 20, an additional \$48 per year is added up to a maximum of \$2,952 per year for 30 or more years of service. Member may elect to receive an optional lump sum benefit of \$12,000 rather than monthly benefits.

Disability Retirement

Eligibility. Disabled to the extent that no longer able to perform services required of a firefighter before being eligible for age & service retirement. If duty related, there is no service requirement. If non-duty related, member must have at least 10 years of service to qualify.

Amount. (1) Duty Related. Same as regular retirement assuming a minimum of 20 years of service.

(2) Non-Duty Related. For 10 years of service, \$744 per year. For each year in excess of 10, an additional \$96 per year is added up to a maximum of \$1,704 per year. Non-duty benefit payments do not begin until member reaches age 50.

Death Benefits

Eligibility.

Spouse. Legally married to member while active and at least 3 years prior to death and residing with member at time of death.

Child. Younger than age 16 or, if full time student, younger than 18.

Amount. 1. If Death Occurs After 20 Years Service As Volunteer

Spouse. \$996 per year for first 20 years of service.

For each year in excess of 20, an additional \$24 per year to a maximum of \$1,236 per year for 30 or more years of service.

Child. \$120 per year per child with \$240 maximum per year.

Spouse and child benefits are not payable until such time as member would have reached age 50 had the member survived.

2. If Death Occurs Prior To Completion Of 20 Years Service But After 10 Years Service And Death Is Not Duty Related.

Spouse. Lump sum payment of \$1,650 for first 10 years service plus \$220 for each full year in excess of 10 but less than 16 plus \$275 for each full year in excess of 15.

Child (maximum of 2). Lump sum payment of \$206 for first 10 years service plus graded increases for each full year in excess of 10 to a maximum of \$481 for 20 years of service.

3. If Death Is Duty Related.

Spouse and Child. Same as benefits under 1. except that (i) benefits are payable immediately and (ii) if member was younger than 50, benefits are based on 20 years service regardless of amount of actual service. At the time the member would have reached age 50, the benefit is recomputed to give credit for any actual service over 20 years.

Lump sum payment of \$1,375 is paid to the surviving spouse or nearest living relative in addition to the benefits listed above.

Vested Deferred

10 But Less Than 20 Years Service.

Lump sum payment of \$6,000 for first 10 years plus \$600 per year for each full year in excess of 10. Payment is deferred to age 50 and termination of service must have resulted from circumstances beyond the member's control.

More Than 20 Years Service And Separated Before Age 50.

Benefit amount is same as age & service benefit and payment beginning is deferred to attainment of age 50.

Member Contributions. None.

Section C

Valuation Methods and Assumptions

Columbia Heights Fire Department Relief Association (Volunteer Division)

Valuation Methods and Assumptions

The Entry Age Normal Cost method was used to determine the normal cost of all benefits. The rate of investment return (interest) as required by state law used in making the valuation was 5.0 percent per annum, compounded annually. Age & service retirement was assumed to occur at age 58, or attained age if older.

Mortality Table*

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	\$177.21	\$189.58	\$280.82	\$314.75	29.50	34.00
50	163.12	177.21	246.55	280.82	25.20	29.50
55	147.50	163.12	212.60	246.55	21.16	25.20
60	130.52	147.50	179.49	212.60	17.42	21.16
65	112.87	130.52	148.28	179.49	14.05	17.42
70	95.20	112.87	119.70	148.28	11.09	14.05
75	77.77	95.20	93.83	119.70	8.52	11.09
80	61.71	77.77	71.69	93.83	6.39	8.52

* UP-1984 Table set forward 2 years for males and set back 3 years for females.

Sample Rates of Separation from Active Employment

Before Retirement, Death or Disability

Sample Ages	% of Active Members Separating within Next Year
20	1.50%
25	1.25
30	1.00
35	0.75
40	0.50
45	0.25
50+	0.00

Pay Adjustment Factor Used To Project Current Pays

<u>Sample Ages</u>	<u>Present Pay Resulting in Pay of \$1,000 at Age 60</u>	<u>Present 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

Use of the pay adjustment factor illustrated above is required by state law.

Anticipated Disability Retirements

<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

Section D

**The Pension Benefit Obligation
and Certain Other Disclosures
Required by Statement No. 5 of the
Governmental Accounting Standards Board**

PENSION BENEFIT OBLIGATION

The amount shown below as the "pension benefit obligation" is a standardized disclosure measure of the present value of pension benefits, adjusted for the effects of projected salary increases, estimated to be payable in the future as a result of employee service to date. The measure is the actuarial present value of credited projected benefits and is intended to (i) help users assess the plan's funding status on a going-concern basis, (ii) assess progress being made in accumulating sufficient assets to pay benefits when due, and (iii) allow for comparisons among public employee retirement plans. The measure is independent of the actuarial funding method used to determine contributions to the plan.

The pension benefit obligation was determined as part of an actuarial valuation of the plan as of December 31, 1986. Significant actuarial assumptions used in determining the pension benefit obligation include (a) a rate of return on the investment of present and future assets of 5.0% per year compounded annually, and (b) the assumption that benefits will not increase after retirement.

At December 31, 1986, the assets in excess of the pension benefit obligation were \$280,733, determined as follows:

Pension Benefit Obligation:

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	\$271,836
Current employees --	
Accumulated employee contributions including allocated investment income	0
Employer financed	<u>92,518</u>
Total Pension Benefit Obligation	\$364,354
Net assets available for benefits, at cost (market value was \$691,128)	<u>645,087</u>
Assets in excess of the Pension Benefit Obligation	\$280,733

Appendices

APPENDIX I

MEANING OF UNFUNDED ACCRUED LIABILITIES

Almost every pension plan (public or private) has "unfunded accrued liabilities", so whatever they are, they aren't rare. Since the term is not part of everyday conversation, it needs some definition.

"Accrued liabilities" are the present value \$ of plan promises to pay benefits in the future based upon service already rendered - - - a liability has been established ("accrued") because the service has been rendered, but the resulting monthly cash benefit may not be payable until years in the future. Accrued liabilities \$ are the result of complex mathematical calculations, which are made by the plan's actuary (which is the name given to the specialist who makes such calculations).

If "accrued liabilities" at any time exceed the plan's accrued assets (cash & investments), the difference is "unfunded accrued liabilities". This is the common condition. If the plan's assets equalled the plan's "accrued liabilities", the plan would be termed "fully funded". This is a rare condition.

Each time a plan adds a new benefit which applies to service already rendered, an "accrued liability" is created, which is also an "unfunded accrued liability" because the plan can't print instant cash to cover the accrued liability. Payment for such unfunded accrued liabilities is spread over a period of years, commonly in the 20-40 year range.

Unfunded accrued liabilities can occur in another way: If actual financial experience is less favorable than assumed financial experience, the difference is added to unfunded accrued liabilities. In plans where plan benefits are directly related to an employee's pay near time of retirement (a common plan provision) rather than his average pay throughout his working career, unfunded accrued liabilities have been increasing in recent years because unexpected rates of pay increase have created additional accrued liabilities which could not be matched by reasonable investment results. Some of these unexpected pay increases are the direct result of inflation, which is a very destructive force on financial stability.

The existence of unfunded accrued liabilities is not bad, then (any more than a mortgage on your house is "bad"), but the changes from year to year in amount of unfunded accrued liabilities are important - - - "bad" or "good" or somewhere in between.

Nor are unfunded accrued liabilities a bill payable immediately (your food costs are payable immediately), but it is important that policy-makers prevent the amount from becoming unreasonably high and it is vital that your plan have a sound method for making payments toward them so that they are controlled.

The existence of large amounts of unfunded accrued liabilities indicates that total contributions in past years were less than level - - - an almost certain history if retired life liabilities are not fully funded now.