Report of
AN ACTUARIAL VALUATION
December 31, 1985 of the
Columbia Heights Fire
Department Relief Association
Columbia Heights, Minnesota

GABRIEL, ROEDER, SMITH & COMPANY

TABLE OF CONTENTS

GABRIEL, ROEDER, SMITH & COMPANY
ACTUARIES & CONSULTANTS
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May 20, 1986

Board of Trustees
Columbia Heights Fire Department Relief Association
Columbia Heights, Minnesota

Submitted in this report are the results of the December 31, 1985 actuarial valuation of the assets, actuarial values and contribution requirements associated with the benefits provided by the Columbia Heights Fire Department Relief Association.

The valuation results contained in Section A provide the actuarial information needed to determine the employer's "minimum obligation" effective January 1, 1987. 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 of Financial Accounting Standards No. 35 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 J. W. Smith
Gary W. Findlay

Ronald J. W. Smith — Gary W. Findlay

SECTION A

RESULTS OF THE VALUATION

COMMENTS

Economic Assumptions and Financing Method

The economic assumptions of 5% annual investment return and 3-1/2% annual salary increases are 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 percent times covered payroll 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 (for example, it is currently not valid to compare valuation results for a plan having full escalation to valuation results for a plan having a 3-1/2% cap on escalation). 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.

Columbia Heights Fire Department Relief Association

CONTRIBUTION RATE TO PROVIDE BENEFITS

Member portion & Employer portion

Effective January 1, 1987

	If Paid Equally Throughout Year		
Contributions for	Normal Cost % of Active Payroll for 1987	+	UAAL Dollars
Normal cost of annuities:			
Age & service: to members	17.96%		
Age & service: to survivors	5.95		
Disability	2.77		
Death before retirement	3.80		
Refunds of member contributions	0.29		
Total Normal Cost	30.77%		
Amortization of unfunded actuarial accrued liabilities (UAAL)			
(24 year level dollar payment)			$ 96,773
Retired lives			9,574
Active members			106,347
Total			
Total Cost of Benefits	30.77%	+	$106,347
Member contributions	8.00%		
COMPUTED EMPLOYER RATE:			
(a) If Paid Equally Throughout Year	22.77%	+	$106,347
(b) IF PAID AT CALENDAR YEAR END	23.33%	+	$108,973

Columbia Heights Fire Department Relief Association

Present Actuarial Condition

The Association's accrued actuarial assets were in excess of $942 thousand on December 31, 1985 -- 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 $942 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.

	Accrued Actuarial Assets	Actuarial Accrued Liabilities	Unfunded Actuarial Accrued Liabilities	% Funded
Retirants and Beneficiaries				
Retired Members (8)		$2,164,884		
Surviving Spouses (1)		125,424		
Surviving Children (0)		0		
Total (9)	$921,862	$2,290,308	$1,368,446	40.3%
Deferred Members (0)	0	0	0	
Active Members (1)	21,000	156,390	135,390	13.4
Total	$942,862	$2,446,698	$1,503,836	38.5%

Actuarial accrued liabilities represent the value, computed as of December 31, 1985 of:

(i) retirement allowances likely to be paid the 9 retirants and beneficiaries; and

(ii) the contributions assumed to have been made for the 1 active member from entry into the plan until December 31, 1985.

To illustrate, the value of retirement allowances likely to be paid the 9 retirants and beneficiaries, discounted for investment earnings and mortality, was computed to be $2,290,308 as of December 31, 1985. This means that if the 9 retirants and beneficiaries live and die according to the assumed mortality and if the $2,290,308 can be invested to yield an average annual return of 5.0 percent over the remaining lifetimes of the 9 retirants and beneficiaries, then the $2,290,308 together with investment earnings thereon will just be sufficient to pay the 9 retirants and beneficiaries their allowances for their remaining lifetimes.

With respect to the active member, the accrued liability of $156,390 represents the amount that would have been accumulated by December 31, 1985 if the normal cost (which is expressed as a level percentage of pay) had been contributed from the date of hire until December 31, 1985 for the 1 active, if these amounts had earned 5.0% interest and if the member 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)

Valuation Date December 31	Actuarial Accrued Liabilities	Accrued Actuarial Assets	Percent Funded
1978	$1,169	$413	35.3%
1979	N/A	N/A	N/A
1980	1,695	591	34.9
1981	1,824	660	36.1
1982	2,149	762	35.5
1983	2,317	798	34.4
1983*	2,448	798	32.6
1984	2,421	940	38.8
1985	2,447	943	38.5

* After change in assumptions.

Columbia Heights Fire Department Relief Association

Computed Contributions - Comparative Schedule

Year Ended December 31 Valuation	Year Ended December 31 Fiscal	Total Normal Cost as a Percent of Valuation Payroll*	Contribution For Unfunded Actuarial Accrued Liabilities - $ or %
1978	1980	34.11%	$ 36,881
1979	1981	N/A	N/A
1980	1982	32.25	71,170
1981	1983	N/A	N/A
1982	1984	30.19	92,398
1983	1985	30.38	103,096
1983	1985**	32.25	112,022
1984	1986	30.78	102,550
1985	1987	30.77	106,347

* Includes employee contributions.

** After change in assumptions.

Columbia Heights Fire Department Relief Association

CONTRIBUTION FOR CALENDAR YEAR EFFECTIVE JANUARY 1, 1987

For any period of time the percent-of-payroll contribution rate is converted to dollars. The amount of dollars for any calendar year depends upon the results of the last actuarial valuation, and upon the timing of contributions within the year. The later the contribution date, the greater the dollar amount will be.

The municipality's dollar contribution for the year may be determined as follows:

(1)	Estimated covered payroll for 1987		$______	
(2)	Total normal cost % from page A-2		30.77%	
(3)	Total normal cost (Line 1 times line 2)			$______
(4)	Amortization payment on UAAL from page A-2			106,347
(5)	Total contributions required (Line 3 plus line 4)			______
(6)	Employee contributions (Line 1 times 8%)		$______	
(7)	(a) State amortization aid based on 12/31/78 UAAL of $755,834	$11,376		
	(b) State amortization aid based on 1984 legislation	2,654		
	(c) Total State amortization aid		14,030	
(8)	Estimated insurance premium aid		______	
(9)	Estimated total contributions from other sources (Line 6 plus line 7 plus line 8)			______
(10)	Employer's Minimum Obligation if payment is made in equal installments throughout the year. (Line 5 minus line 9)			$______
(11)	EMPLOYER'S MINIMUM OBLIGATION IF PAYMENT IS MADE AT YEAR END (Line 10 times 1.0247)			$______

SECTION B

VALUATION DATA

AND

SUMMARY OF BENEFIT PROVISIONS

Columbia Heights Fire Department Relief Association

Retirants and Beneficiaries December 31, 1985

By Type of Annuity Being Paid

Type of Annuity Being Paid	No.	Monthly Amounts	Computed Actuarial Accrued Liabilities
Retirants receiving:			
Age & Service	7	$7,792.54	$1,873,524
Disability	1	1,152.50	291,360
Totals	8	8,945.04	2,164,884
Beneficiaries receiving:			
Spouse	1	922.00	125,424
Child	0	0.00	0
Totals	1	922.00	125,424
Totals	9	$9,867.04	$2,290,308

Columbia Heights Fire Department Relief Association

Retirants and Beneficiaries December 31, 1985

By Attained Ages

Attained Ages	Number: Age & Service	Disability	Death Before Retirement
50-54	2		
55-59	2	1	
60-64	2		
70-74	2		
Totals	8	1	

Columbia Heights Fire Department Relief Association

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		% Incr. in Annual Allowances	Average Allowances	Discounted Value of Allowances	
			No.	Annual Allowances			Total	Average
1978			3	$ 25,827	- %	$ 8,609	$ 435,960	$145,320
1979	1		4	38,884	50.6	9,721	708,665	177,166
1980			4	42,338	8.9	10,585	748,701	187,175
1981	2		6	68,626	62.1	11,438	1,163,257	193,876
1982	1		7	83,092	21.1	11,870	1,604,063	229,152
1983	1		8	98,555	18.6	12,319	2,059,643	257,455
1984	2	1	9	114,589	16.3	12,732	2,279,700	253,300
1985			9	118,404	3.3	13,156	2,290,308	254,479

Columbia Heights Fire Department Relief Association

Active Members December 31, 1985

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	No.	Valuation Payroll
40-44				1				1	$27,658
Totals				1				1	$27,658

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

Age: 43.0 years.

Service: 16.8 years.

Annual Pay: $27,658.

Columbia Heights Fire Department Relief Association

Comparative Schedule

Of Active Members

Valuation Date December 31	Active Members	Valuation Payroll	Average			
			Age	Service	Pay	% Incr.
1978	7	$119,532	48.0 yrs.	18.5 yrs.	$17,076	- %
1979	6	119,520	48.7	19.4	19,920	16.7
1980	6	130,272	49.7	20.4	21,712	9.0
1981	4	94,656	49.0	20.1	23,664	9.0
1982	3	74,592	50.0	21.4	24,864	5.1
1983	2	51,468	51.0	21.3	25,734	3.5
1984	1	26,763	42.0	15.8	26,763	4.0
1985	1	27,658	43.0	16.8	27,658	3.3

Columbia Heights Fire Department Relief Association (Paid Division)

Brief Summary (12/31/85) of Benefit Provisions Evaluated and/or Considered

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Age & Service Retirement

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

Amount. For first 20 years of service, 35/80 of base pay. For each year in excess of 20, an additional 1/80 is added up to a maximum of 45/80 of base pay for 30 or more years of service. In addition, and not subject to the above maximum, for each year over 25, a benefit of 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 salary of a first grade fireman.

Disability Retirement.

Eligibility. Disabled to the extent that no longer able to perform the duties of a fireman before being eligible for age & service retirement.

Amount.

(1) Less than 10 years service - 30/80 of base pay.

(2) 10 to 15 years service - 35/80 of base pay.

(3) 15 or more years service - 40/80 of base pay to age 50 at which time the benefit is recomputed based on service assuming a minimum of 20 years of service.

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.

Child. Younger than age 18, or 22 if full time student.

Amount.

Spouse. 32/80 of base pay.

Child. 4/80 of base pay per child. Children's maximum is 8/80 of base pay if spouse is receiving or 12/80 of base pay 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. Total member contributions are refundable, without interest, upon separation from service if no monthly benefit is payable.

SECTION C

VALUATION METHODS AND ASSUMPTIONS

Columbia Heights Fire Department Relief Association

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) used in making the valuation was 5.0 percent per annum, compounded annually. State law requires use of this assumption.

The mortality table used was the UP-1984 Table set forward 2 years for males and set back 3 years for females.

Sample Ages	Single Life Values: Present Value of $1 Monthly — Level For Life: Men	Level For Life: Women	Increasing 3.5% Yearly: Men	Increasing 3.5% Yearly: Women	Future Life Expectancy (Years): Men	Future Life Expectancy (Years): 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

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	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

Sample Ages	Present Pay Resulting in Pay of $1,000 at Age 60	Present Increase in Pay During Next Year
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.

Disability retirements were assumed to occur as indicated below:

Sample Ages	% of Active Members Becoming Disabled within Next Year
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

ACCUMULATED PLAN BENEFITS

Columbia Heights Fire Department Relief Association

Statement of the Present Value of Accumulated Plan Benefits

December 31, 1985

Actuarial Present Value of Accumulated Plan Benefits	
Vested Benefits:	
Participants currently receiving payments	$2,270,640
Other participants	162
Total Vested Benefits	2,270,802
Non-Vested Benefits	76,847
Total Actuarial Present Value of Accumulated Plan Benefits	$2,347,649

The actuarial present value of accumulated plan benefits as of January 1, 1985, was $2,327,279. During the year, the plan experienced a net increase of $20,370 in the actuarial present value of accumulated plan benefits due to general plan experience.

The accompanying notes are an integral part of the Statement of the Present Value of Accumulated Plan Benefits.

1. The actuarial present value of accumulated plan benefits presented in this statement was determined using the following assumptions:

   a. Future salary increases prior to retirement were not considered for active members.

   b. Future service was considered only to the extent that it would permit active plan participants to become eligible for benefits attributable to service rendered prior to the date of determination.

   c. Regular valuation assumptions were used as to mortality, withdrawal, retirement ages and disability.

   d. Investment return was assumed to be at the rate of 8% compounded annually.

   e. Salary increase related post retirement benefit adjustments were assumed to be at the rate of 6-1/2% compounded annually unless a lower rate is specified by law.

2. The calculation of the actuarial present value of accumulated plan benefits was made because of the requirements of the Financial Accounting Standards Board. Comparison of this value with plan assets is not indicative of the future ability of the plan to pay benefits when due or of their security in a termination situation.

   Calculation of contribution requirements and related benefit value information in a "going concern" environment according to the principles of level cost financing is made by the annual actuarial valuations. The results of the contribution rate calculations cannot be simply replaced by the accumulated plan benefit results. To do so will mislead.

APPENDICES

APPENDIX I

FINANCIAL PRINCIPLES AND OPERATIONAL TECHNIQUES

Promises Made, and Eventually Paid. As each year is completed, the plan in effect hands an "IOU" to each member then acquiring a year of service credit -- the "IOU" says: "The Pension Plan owes you a portion of your retirement benefits, payments to be made in cash, commencing when you qualify for retirement."

The related key financial questions are:

Which generation of taxpayers contributes the money to cover the IOU?

The present taxpayers, who receive the benefit of the member's present year of service?

Or the future taxpayers, who happen to be in town paying taxes at the later time when the IOU becomes a cash demand?

A sound principle of sound retirement plan financing is to have this year's taxpayers contribute the money to cover the IOUs being handed out this year. By following this principle, THE CONTRIBUTION RATE WILL REMAIN APPROXIMATELY LEVEL FROM GENERATION TO GENERATION -- our children and grandchildren will contribute the same percents of active payroll we contribute now.

A PENSION PLAN BECOMES CLOSED

The diagram in this appendix shows two important activities which occur after a plan has been closed to employees hired in the future.

Cash benefits paid continue to increase for decades, while active member payroll begins to decrease to zero.

Funding Method. A funding method is the long-term, planned pattern for employer contributions.

For an open plan (a plan covering future employees), the level-percent-of-active-member payroll funding method is the basic funding method.

The level-percent funding method can also be applied to a closed plan. However, the resulting contribution percent usually jumps to a high rate, because the number of covered active members is decreasing.

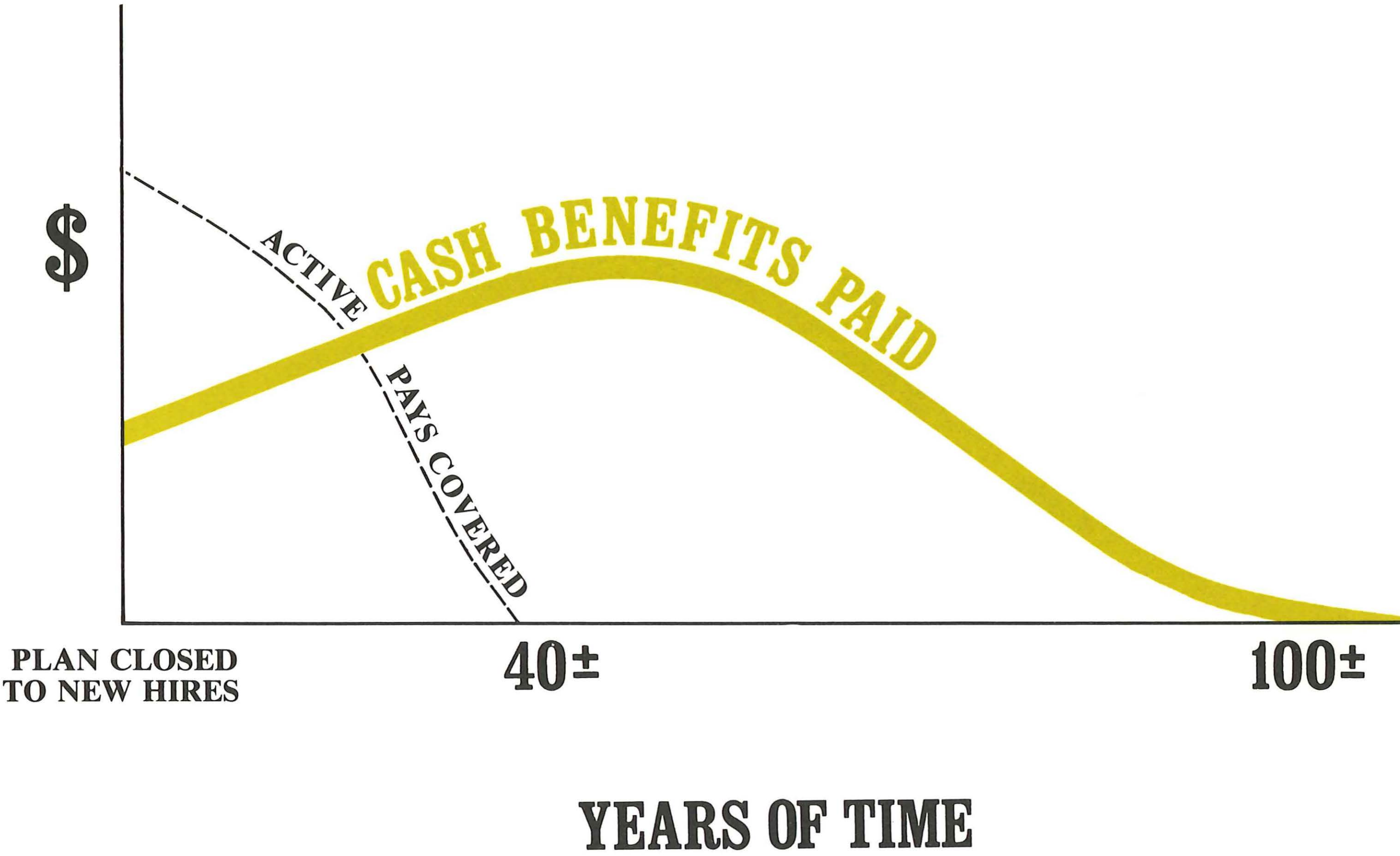
A preferred funding method for a closed plan consists of: level-percent funding for normal cost (the cost of members' service now being rendered); plus a level dollar contribution for unfunded actuarial accrued liabilities over a limited period of years. The period of years must be limited so that plan assets don't become zero while benefits are still payable.

Computing Contributions To Support Plan Benefits. From a given schedule of benefits and from the employee data and asset data furnished him, the actuary determines the contribution rates to support the benefits by means of an actuarial valuation and a funding method.

In making an actuarial valuation, assumptions must be made regarding anticipated financial experiences for the next year and for decades in the future. Only the subsequent actual experience of the plan can indicate the degree of accuracy of the assumptions. Reconciling Differences Between Assumed Experience and Actual Experience. Once actual experience has occurred and been observed, it will not coincide exactly with assumed experience, regardless of the wisdom of the assumptions or the skill of the actuary and the millions of calculations he made. The future can be predicted with considerable but not 100% precision, except for inflation which seems to defy reliable prediction.

A well-managed plan copes with these continually changing differences by having periodic actuarial valuations. Each actuarial valuation is a complete recalculation of assumed future experience, taking into account all past differences between assumed and actual experience. The result is continuing adjustment in financial position.

A CLOSED PENSION PLAN



A plan becomes closed when no new hires are admitted to active membership. The persons covered by the plan at the time of closing continue their normal activities and continue to be covered by the plan, until the last survivor dies.

CASH BENEFITS LINE. After a pension plan becomes closed, the usual pattern is for cash benefits to continue to increase for decades of time. Eventually the cash benefits will peak, and then gradually decrease over more decades of time, ultimately to zero. The last cash benefit is likely to occur a century after the time the plan is closed.

The precise amounts of cash benefits cannot be known now, and must be estimated by assumptions of future experiences in a variety of financial risk areas.

APPENDIX II

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.