UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN

Actuarial Valuation
as of June 30, 1987

January 7, 1988

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UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN

Actuarial Valuation as of June 30, 1987

PURPOSE AND SUMMARY

The purpose of this report is to set forth the results of our actuarial valuation of the University of Minnesota Supplemental Benefits Plan as of June 30, 1987 in accordance with Chapter 356 of the Minnesota Statutes. The valuation has been based on employee census data as of June 30, 1987 and plan provisions in effect as of June 30, 1987. In summary, our valuation reveals a Chapter 356 requirement of $361,900, well short of the $1,261,400 of annual benefits payable to retirees as of the valuation date.

The plan is composed of two distinct groups:

- Employees who began participation in the Faculty Retirement Plan prior to 1963. This is essentially a closed group of participants; namely, existing retirees and a diminishing group of active participants soon to retire.
- Female participants in the Faculty Retirement Plan for whom contributions to FRP were made at any time prior to July 1, 1982. A few of these participants are already retired, however, most are still active. This is also a closed group.

A detailed description of plan benefits is presented in Tables 3(a), 3(b) and 3(c).

Since appropriate projections would substantiate the diminishing nature of benefits payable under this program, any attempt to fund it strictly in accordance with the Statutes would prove to be meaningless. That is, a funding approach in strict accordance with Chapter 356 would result in a negative cash flow since current disbursements exceed resulting Chapter 356 contribution requirements.

As noted in prior reports, normal anticipated attrition of the covered group, combined with payment of current benefits from external sources, will indirectly fund the unfunded accrued liability at a rate more rapid than that prescribed under the Statutes. As set forth later in Table 6 of the report, the indirect method of funding through payment of current benefits, in conjunction with additional contributions to the plan (total amounts are substantially in excess of Chapter 356 requirements), resulted in a reduction of the unfunded accrued liability under the plan from $6,586,700 as of June 30, 1986 to $4,334,000 as of June 30, 1987.

EMPLOYEE AND FINANCIAL DATA

We received complete data covering 289 active pre-1963 participants under the Faculty Retirement Plan. Based on current account balances and the actuarial assumptions set forth below, it is projected that one member of this group would receive benefits from the Supplemental Benefits Plan. In addition, we were furnished a listing for the 500 retirees, survivors and widows presently receiving or eligible to receive benefits under the plan. We also received a summary by age grouping of account balances under the Faculty Retirement Plan for female participants at October 5, 1987. From this data we estimated the total account balances as of June 30, 1987 subject to unisex adjustment. All of this data as utilized for valuation purposes is summarized in Table 2 of this report.

Assets of $8,948,425 as of June 30, 1987 were reported to us by the University, including 1987 plan year contributions, in addition to current disbursements made from general funds, totalling $743,100.

PLAN VALUED

Since benefits under this program are directly dependent on the level of benefits payable under the University's Faculty Retirement Plan, in addition to summarizing the pertinent provisions of the Supplemental Benefits Plan (pre-June 30, 1977 and post-June 30, 1977 in Tables 3(a) and 3(b), respectively) we have set forth a complete description of the principal provisions of the FRP plan in Table 3(c).

In brief, effective for retirement on or after June 30, 1977, the University adopted the revised "50%" formula as the target for supplemental benefits (as outlined in Table 3(b)) while at the same time retaining the prior formula as a "minimum" measure of benefits payable.

This report continues to reflect the revised early retirement provision that became effective on June 30, 1978 to coordinate with the current treatment of early retirees under the Faculty Retirement Plan (FRP benefits are currently payable immediately upon early retirement between ages 62 and 65, and the University no longer continues to make FRP contributions to an early retiree). Thus, on early retirement, benefits are payable immediately from the supplemental plan and are determined as follows:

(i) the 1-2/3% "target benefit" is projected to age 65

(ii) the FRP annuity equivalent and Social Security are both determined as payable immediately.

(iii) the benefit payable immediately is the difference between (i) and (ii).

This approach introduces an additional cost over what had been recognized in years prior to June 30, 1978, primarily attributable to the entire benefit being payable from this plan up to age 65 (previously these costs were charged back to the member's department outside the plan).

Recognizing these additional costs which emerge as participants retire early (we assume that members retire at age 66, on the average), the plan funds are reimbursed for the portion of total current disbursements representing these additional payments.

ACTUARIAL ASSUMPTIONS AND METHODS

The actuarial assumptions and methods employed in this valuation are outlined in Table 4 of this report. These assumptions and methods conform to those provisions of Chapter 356 of the Minnesota Statutes.

The actuarial method utilized is the entry-age-normal cost method as prescribed by Statutes. Under this method, the normal cost is determined as the level percentage of future covered payroll which would be required to be paid from each member's date of employment to retirement in order to provide the benefits under the plan. The accrued liability under this method is equal to the present value of all benefits payable under the plan less the present value of future normal costs calculated in accordance with the actuarial cost method. The unfunded accrued liability is then determined by subtracting the assets on the valuation date from the accrued liability. Minnesota Statutes call for annual normal costs to be provided in addition to the amortization of unfunded accrued liabilities as of the first valuation made after June 1, 1979 by the end of the fiscal year occurring in 2009. The amortization of the additional unfunded accrued liability generated by benefit improvements is determined by first computing the amortization over 30 years. The amount of this amortization is added to the amortization of the June 1, 1979 amount and a determination is made of the fiscal year when this combined payment will have fully funded the total unfunded accrued liability. Due to the increases in benefits which have occurred since 1979, all unfunded accrued liabilities are being amortized by the end of the fiscal year occurring in 2012.

Actuarial assumptions were identical to those used in the prior year and reflect the current Social Security Law. As indicated, the amount of benefits provided under the supplemental plan are directly dependent on those benefits provided under the FRP plan. Thus, in order to appropriately determine projected benefits payable, advance assumptions were also made in regard to future projections under the FRP itself; namely, that contribution levels would continue in accordance with the salary scale assumption set forth in item 5 of Table 4. For this purpose, fund balances were projected assuming a return of 5% per annum with accumulated values converted to annuity benefits on the basis of a continuation of purchase rates utilized in 1975. This maintains a degree of conservatism in the valuation, since current annuity purchase rates (which, effective July 1, 1987, are based on an assumed interest rate of 9%) applied to determine offsetting FRP benefits are more favorable than those used in 1975 (which are based on an assumed interest rate of 6¼%). Utilization of this more conservative basis for valuation purposes is consistent with the salary/investment return described below.

It should be noted that the combined salary/investment return assumptions of 3½%/5% are prescribed by Statute and do not anticipate future increases of an inflationary nature. In fact, to the extent that salaries increase more than 3½% and basic FRP accumulations take place at a rate in excess of 5%, the increased level of FRP benefits would serve to diminish supplemental benefits payable from the plan. Any future increases in offsetting Social Security benefits will also serve to reduce supplemental benefits payable from the plan under the post June 30, 1977 formula.

With regard to the account balances for female participants which are subject to unisex adjustment it should be noted that any interest earnings in excess of the assumed rate of 5% will serve to increase the liability for this group.

VALUATION RESULTS

The results of our valuation are set forth in Table 1. Section A of the table sets forth basic data items relative to active and retired (including survivors and widows) participants.

Section B sets forth the determination of accrued liability, unfunded accrued liability, annual normal cost, and annual cost provision all in accordance with Chapter 356, with the Chapter 356 annual cost provision amounting to $361,900 and the current disbursement requirement of $1,261,400.

GAIN AND LOSS ANALYSIS

In Table 5 we reconcile the unfunded accrued liability over the past year and set forth a gain and loss analysis. This analysis denotes a decrease of $574,600 in the June

30, 1987 unfunded accrued liability when compared to that expected. Actuarial gains resulted primarily from earnings in excess of 5% on supplemental plan assets and from mortality and turnover. These gains were partially offset by actuarial losses resulting from early retirements and from earnings in excess of 5% on female account balances subject to unisex adjustment.

COMPARISON OF 1986 and 1987 VALUATION RESULTS

In Table 6, we set forth a comparison of the principal values underlying the 1986 and 1987 valuations. The unfunded accrued liability has decreased from $6,586,700 to $4,334,000.

* *

If in connection with this report, any further investigations are indicated, we will be happy to proceed as directed.

Respectfully submitted,

THE WYATT COMPANY

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Table I

UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN

Actuarial Valuation as of June 30, 1987
(Valuation determinations rounded to nearest $100)

A. BASIC DATA

1.	Active Pre-1963 Participants			
	(a)	Total active pre-1963 participants under Faculty Retirement Plan (FRP)		289
	(b)	Total projected to receive supplemental benefits		
		(i) Number		1
		(ii) Average annual projected supplement 1/		1,594
2.	Estimated Account Balance for Female Participants at July 1, 1987			30,166,331
3.	Retirees, Survivors and Widows			
	(a)	Number receiving or entitled to receive benefits		500
	(b)	Average annual benefit being paid		2,523

B. DETERMINATION OF ANNUAL REQUIREMENTS IN ACCORDANCE WITH CHAPTER 356 (MINNESOTA STATUTES)

1.	Accrued Liability as of June 30, 1987		
	(a)	Actives	12,700
	(b)	Retirees	8,416,100
	(c)	Widows	274,800
	(d)	Survivors	1,433,900
	(e)	Female unisex increase 7/1/82	3,144,900
	(f)	Total	13,282,400
2.	Assets as of June 30, 1987		8,948,400
3.	Unfunded Accrued Liability as of June 30, 1987 (1(f) less 2)		4,334,000
4.	Annual Normal Cost		69,000

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THE Wyatt COMPANY

5. Annual Requirement to Fund Normal Cost and Amortize the Unfunded Accrued Liability by June 30, 2012

(a)	Amortization of Unfunded Accrued Liability by June 30, 2012	292,000
(b)	Normal cost	69,000
(c)	Total	361,900

6. Annual Rate of Benefit Payment 1,261,400

1/ Per investment earnings, salary scale, and Social Security assumptions summarized in Table 4.

Table 2

UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN

Distribution of Participants as of June 30, 1987

A. ACTIVE PARTICIPANTS (Pre-1963 FRP Participants)

Age Group Last Birthday	Males	Females	Total
50 - 54	10	1	11
55 - 59	78	1	79
60 - 64	107	9	116
65 & Over	79	4	83
Total	274	15	289

B. WIDOWS OF PRE-1956 RETIREES

Age Group Last Birthday	Number (All Females)	Annual Benefit Being Paid
75 - 79	1	$ 4,464
80 - 84	3	13,392
85 - 89	3	13,392
90 & Over	6	26,784
Total	13	$ 58,032

C. SURVIVORS

Age Group Last Birthday	Number (All Females)	Annual Benefit Being Paid
55 - 59	1	$ 2,034
60 - 64	3	5,548
65 - 69	5	11,972
70 - 74	17	45,712
75 - 79	20	65,322
80 - 84	7	21,758
85 - 89	7	21,621
Total	60	$ 173,967

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D. RETIREES

Age Group Last Birthday	Males	Females	Total	Annual Benefit Being Paid
55 - 59	-	-	-	$ -
60 - 64	1	11	12	12,308
65 - 69	46	24	70	70,273
70 - 74	121	36	157	255,345
75 - 79	72	17	89	269,205
80 - 84	53	8	61	227,119
85 - 89	16	6	22	109,265
90 & Over	9	7	16	85,930
Total	318	109	427	$1,029,445

E. RECONCILIATION OF RETIREES/WIDOWS/SURVIVORS

		Number
1.	Number receiving benefits last year	513
2.	Deaths during year with no continuing benefits payable	16
3.	New retirees this year	3
4.	Number receiving or entitled to receive benefits this year (1 - 2 + 3)	500*

* as follows:

Widows	13
Survivors	60
Retirees	427
Total	500

F. ESTIMATED FACULTY RETIREMENT PLAN ACCOUNT BALANCES FOR FEMALE PARTICIPANTS AS OF JUNE 30, 1987 ATTRIBUTABLE TO CONTRIBUTIONS MADE PRIOR TO JULY 1, 1982

Age	Number Of Participants	Total Account Balance
25	0	$ 0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	3	92,031
32	1	4,535
33	4	8,883

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Age	Number Of Participants	Total Account Balance
34	10	67,816
35	6	57,757
36	19	114,170
37	24	303,033
38	32	382,927
39	33	337,733
40	27	447,278
41	32	573,683
42	32	713,300
43	27	648,365
44	31	851,640
45	36	1,189,187
46	36	1,111,572
47	27	931,511
48	30	1,140,620
49	29	1,311,166
50	24	1,025,734
51	35	2,122,810
52	22	965,316
53	23	1,143,845
54	19	1,073,384
55	21	1,158,571
56	18	714,069
57	23	850,608
58	15	922,373
59	16	809,436
60	20	955,590
61	22	1,579,227
62	20	1,620,429
63	14	958,935
64	17	1,267,194
65	9	1,067,161
66	9	503,158
67	5	273,531
68	4	384,152
69	3	141,920
70	1	81,943
71	2	247,081
73	1	2,663
76	1	9,994
Total:	783	$30,166,331

Table 3(a)

UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN (PRE-JUNE 30, 1977)

Summary of Principal Provisions of the Supplemental Plan
(provisions in effect for pre-June 30, 1977 retirees)

1. Eligibility:

Generally applicable to employees who first began participation in the Faculty Retirement Plan prior to 1963, and who retire on or after the June 30, next following the 65th birthday. Special early retirement provisions are available (see below).

2. Amount of Supplement:

Supplement (annual) is computed as follows:

(a) Determine 2% of final five year average salary for each year of actual service (maximum 30), but not to exceed the following:

(i)	Professor	$8,500
(ii)	Associate Professor	$8,000
(iii)	Assistant Professor or Instructor	$7,500

(b) Convert Faculty Retirement Plan net accumulations to fixed dollar life annuities using fixed annuity factors under FRP. Note that variable accumulations are converted on fixed basis for this purpose. Prior endowment accumulations are treated as annuity in this computation.

(c) Deduct $1,524 (estimate of 1963 Social Security level) from (a).

(d) Determine supplement as equal to (a) less (b) after adjustment for (c).

(Note: Dividends payable for coverage prior to 1963 are not included in (b) above. 1963 and later coverage dividends are included by direct reflection in interest credited on accumulations).

3. Early Retirement: (Note: Any reference to age 65 in this description means the June 30th following the 65th birthday).

A member may retire as early as age 62 in which case his FRP accounts are used to purchase an annuity commencing immediately. Supplemental benefits payable are determined as follows:

(a) Determine 2% of final five year average salary for each year of service (projected to age 65 but subject to a maximum of 30) not to exceed the following:

(i)	Professor	\$8,500
(ii)	Associate Professor	\$8,000
(iii)	Assistant Professor or Instructor	\$7,500

(b) Convert Faculty Retirement Plan net accumulations to fixed dollar life annuities payable at early retirement using annuity factors under FRP. Note that variable accumulations are converted on a fixed basis for this purpose.

(c) Deduct \$1,524 (estimate of 1963 Social Security level) from (a).

(d) Determine supplemental benefit as equal to (a) less (b) after adjustment for (c).

Table 3(b)

UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN (JUNE 30, 1977)

Summary of Principal Provisions of the Supplemental Plan
(provisions in effect for June 30, 1977 and later retirees)

1. Eligibility: Generally applicable to employees who first began participation in the Faculty Retirement Plan prior to 1963, and who retire on or after the June 30, next following the 65th birthday. Special early retirement provisions are available (see below).

2. Amount of Supplement: Greater of benefit as determined under Supplemental Benefits Plan (Pre-June 30, 1977) or benefit computed as follows:

(a) Determine final five year average salary subject to following maximums for indicated retirement years:

Year	Amount	Year	Amount	Year	Amount
1976-77	$37,200	1981-82	$45,300	1986-87	$55,100
1977-78	38,700	1982-83	47,100	1987-88	57,300
1978-79	40,300	1983-84	49,000	1988-89	59,600
1979-80	41,900	1984-85	51,000	1989-90	62,000
1980-81	43,600	1985-86	53,000	1990-91	64,500

(b) Determine 1-2/3% of final five year average salary for each year of actual service (maximum 30).

(c) Convert Faculty Retirement Plan net accumulations to fixed dollar life annuities using fixed annuity factors under FRP. Note that variable accumulations are converted on fixed basis for this purpose.

(d) Determine 100% of estimated primary Social Security benefit payable based on continuous coverage from date of University hire (or January 1, 1955, if later), to the date of retirement.

(e) Determine supplement equal to the excess of (b) over the sum of (c) plus (d).

3. Early Retirement: (Note: Any reference to age 65 in this description means the June 30th next following the 65th birthday).

A member may retire as early as age 62 in which case his FRP accounts are used to purchase an annuity commencing immediately. Supplemental benefits payable are determined as follows:

(a) Determine final five year average salary subject to the following maximums based on the year of early retirement:

Year	Amount	Year	Amount	Year	Amount
1978-79	$40,300	1982-83	$47,100	1986-87	$55,100
1979-80	41,900	1983-84	49,000	1987-88	57,300
1980-81	43,600	1984-85	51,000	1988-89	59,600
1981-82	45,300	1985-86	53,000	1989-90	62,000

(b) Determine 1-2/3% of final five year average salary for each year of actual service, including projected service to age 65 (maximum 30).

(c) Convert Faculty Retirement Plan net accumulation to fixed dollar annuities using fixed annuity factors under FRP and reflecting early retirement. Note that variable accumulations are converted to the fixed basis for this purpose.

(d) Determine 100% of estimated primary Social Security benefit payable at early retirement based on continuous coverage from date of University hire (or January 1, 1955 if later) to the date of retirement.

(e) Determine supplement equal to the excess of (b) over the sum of (c) plus (d).

4. Unisex Adjustment Policy Established July 1, 1982:

Periodic retirement benefits paid pursuant to the Faculty Retirement Plan shall be equalized for similarly situated males and females effective July 1, 1982. To the extent that benefits in addition to those which are available from the annuity contracts shall be required, such amounts shall be paid through the University of Minnesota Supplemental Benefits Plan.

The equalization shall be accomplished in the following manner:

For Individuals Not Yet Retired:

1. All contributions to the faculty retirement plan after the effective date shall be applied to purchase annuities under sex-neutral (unisex) rates.

2. Total benefits (annuities plus supplement) from contributions to the faculty retirement plan which are made prior to the effective date shall be determined by using male mortality rates for all University employees and female mortality rates for all joint annuitants under the joint and survivor option.

For Individuals Already Retired:

The amount of the total periodic benefit (annuity plus supplement) being paid shall be recalculated using male mortality rates for all University employees and female mortality rates for all joint annuitants under the joint and survivor option. In those instances where the application of such mortality rates provides for increased benefits, such increased benefits shall be paid through the University supplement on a retroactive and prospective basis.

5. Post-Retirement Benefit Increases Established July 1, 1981 and July 1, 1984:

Increases granted to certain retired faculty in the amount of $600 for a full share and $480 for an 80% share with full shares being paid to those retirees who are receiving single life annuities and 80% shares paid to retirees, or surviving spouses of retirees, who elected the survivorship option. Those retired faculty eligible to receive the increase shall be determined as follows:

1. Exclude Vice Presidents, Widows of Vice Presidents, and those with Dean status for retirement purposes.

2. Include only pre-1963 participants, who retired on or before June 30, 1980 (June 30, 1983 for July 1, 1984 increase) and who are not specifically excluded, whether or not they are currently receiving a Supplement payment. 1969 and later surviving spouses currently receiving a Supplement are considered participants.

6. <u>Post-Retirement Benefit Increase Established July 1, 1986:</u>

Benefit increases were granted to pre-1963 participants who retired not later than July 1, 1985, excluding those Vice Presidents and Deans who qualified for special benefits, but including surviving spouses of retirees who elected the survivorship option. The amount of increase was $13.00 (single life annuities) or $10.40 (joint and survivor or surviving spouse annuities) per year for each "point," where one point was awarded for each year of service up to 30 years and 1½ points were awarded for each year since retirement. The value of a point was determined by the amount of funds available in the department budget for increases.

7. <u>Cost of Living Increases Granted to Widows of Pre-1956 Retirees:</u>

Effective Date	Revised Annual Benefit
July 1, 1981	$4,020 (formerly $3,330)
July 1, 1984	4,176
January 1, 1986	4,464

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Table 3(c)

UNIVERSITY OF MINNESOTA
FACULTY RETIREMENT PLAN

Summary of Principal Provisions of the Faculty Retirement Plan

1. **Eligibility:** All full time academic staff members (including certain civil service staff members) participating in $20,000 Group Life program, eligible to participate as follows:

	Classification	Date of Participation
(a)	Associate professor or higher	Date of hire.
(b)	Assistant professor or research associate	Immediately following two years of service.
(c)	Instructor or research fellow	Immediately following three years of service.
(d)	Professional and Administrative	(i) If salary less than $36,693, same as (c).* (ii) If salary greater or equal to $36,693 but less than $43,157, same as (b). (iii) If salary greater than or equal to $43,157 same as (a). * Salary breakpoints as of July 1, 1987.

2. **Financing:** Staff member contributes 2½% of gross annual salary, with University making contributions of 2½% of the first $5,000 of gross annual salary, plus 13% of such gross annual salary in excess of $5,000. Effective in 1973, summer research and training grants have been included for nine-month appointees for the purposes of determining compensation for contributions.

3. **Mandatory Retirement Age:** June 30 following 70th birthday for tenured faculty and continuous appointment in the Professional and Administrative Class. All others have no mandatory retirement age.

4.	Date to Which University Contributions are Made:	Contributions are continued until date of retirement.
5.	Investment Vehicles (Pre-Retirement):	Contributions are accumulated through insured annuity contracts and/or mutual funds, as follows: (a) Annuity contracts (i) Fixed dollar: accumulate at rate of interest declared by insurers, but never less than minimum stipulated. (ii) Variable Income: Net contributions are immediately converted to accumulation units which are valued each month. Unit values reflect earnings of separate account less the fixed investment charge stipulated (subject to guaranteed maximum charges). Past and future accumulations are transferable to fixed in pre-retirement period. (b) Mutual funds: Participants may invest in one or more of a variety of mutual funds offered by the Vanguard Group.
6.	Forms of Payment Available at Retirement:	(a) Annuity contracts: Either guaranteed fixed retirement annuities or non-guaranteed variable annuities are provided (see (7) for conversion). Fixed funds cannot be converted to variable annuity basis at retirement although variable fund conversion to fixed annuity is allowed in which case, accumulation units would be cancelled and transferred to the general assets of the insurer to be applied to provide guaranteed retirement annuity coverage. Alternatively, rollover of accumulation to IRA is permitted. (b) Mutual funds: Cash distribution or IRA rollover.
7.	Amount of Annuity Benefits:	At retirement, the cash value (representing accumulation of contributions under fixed dollar contracts or value of accumulation units under variable contracts) is applied to provide "life only" retirement income on the basis of stipulated income conversion factors as listed below. In the determination of the monthly income on the "fixed income" basis, a $200 set-up charge is deducted from the proceeds prior to application of the "fixed income" factor. Account balances resulting from contributions made prior to July 1, 1982 will be applied on a male employee and female joint annuitant basis. Account balances resulting from contributions made subsequent to July 1, 1982 will be applied on a unisex basis.

7/1/87 Conversion Basis	Monthly Income for Each $1,000 of Proceeds — Fixed Income (9% interest net) Age 65	Age 68	Variable Annuity (4% interest net) Age 65	Age 68
Pre-7/1/82 contributions:				
Male	10.12	10.86	7.08	7.83
Female	9.21	9.71	6.13	6.66
Contributions 7/1/82 and later:				
Unisex:	9.53	10.12	6.47	7.08

(NOTE: In the past when fixed income conversion factors proved to be too conservative, excess interest credits were being accorded to benefits in payment status via year-end dividends. Certain prior retirees are still being credited with excess interest dividend increases).

8. Early Retirement: Participants may retire early, with annuity equivalents payable immediately.

9. Vesting (termination value): Immediate 100% vested right in accumulations to date of termination.

10. Death Benefits:

(a) Pre-retirement: Named beneficiary would receive total termination value of retirement annuity as in (9). Optional forms of payment as may be elected by beneficiary must be approved by the University.

(b) Post-retirement: In accordance with optional form of payment elected, as follows:

(i) life annuity with no post-retirement death benefit.

(ii) life annuity with 60, 120, 180, or 240 monthly payments guaranteed in any event.

(iii) joint and 100% survivor annuity with 120 monthly payments guaranteed payable in any event.

(iv) joint and 66-2/3% to survivor annuity with 120 monthly payments guaranteed payable in any event.

11. Disability:

In the event of total and continuous disability for a period of at least four months, all contributions are waived with future credits being accorded on the basis of a continuation of contribution levels in effect at time of disability.

Table 4

UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN

Summary of Actuarial Assumptions and Methods

1.	Mortality:	Progressive Annuity Mortality Table set back 0.6 for males and 4.6 years for females.
2.	Turnover:	None assumed.
3.	Expenses:	None assumed. To be met directly.
4.	Interest Rate:	5% per annum.
5.	Salary Scale:	3½% per annum.
6.	Assumed Retirement Age:	June 30th following 66th birthday.
7.	Actuarial Cost Method:	Individual entry-age-normal cost method, with normal cost determined as a level percentage of future covered payroll.
8.	Amortization of Unfunded Accrued Liability:	As a level dollar amount by June 30, 2012.
9.	Faculty Retirement Plan Accumulations:	Accumulated at 5% per annum assuming a continuation of present contribution percentages on increasing covered payroll (per salary scale assumption). Net accumulations converted to fixed dollar life annuities using following 6¼% factors (monthly income for each $1,000 of proceeds). Male 8.65 Female 7.64 Unisex 8.55
10.	Social Security:	Based on present law and 3½% salary scale applicable to current salaries. No wage base or cost of living increases are projected.

Table 5

UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN

Gain and Loss Analysis (Plan Year Ending June 30, 1987)

1.	Unfunded Accrued Liability as of June 30, 1986	$6,586,700
2.	Normal Cost	74,300
3.	Interest at Valuation Rate (5%) on (1) and (2)	333,100
4.	Contributions During Year	
	(a) Approximate "pay-as-you-go" payments to retirees	1,291,500
	(b) Supplemental contributions	743,100
	(c) Total effective contributions ((a) + (b))	2,034,600
5.	Interest at Valuation Rate (5%) on 4(a) and 4(b)	50,900
6.	Expected Unfunded Accrued Liability as of June 30, 1987 (1 + 2 + 3 - 4 - 5)	4,908,600
7.	Actual Unfunded Accrued Liability as of June 30, 1987	4,334,000
8.	Actuarial Gain During Year (6 - 7)	574,600
9.	Gain and Loss Analysis	
	(a) Gain due to increase in offsetting Social Security benefits	1,200
	(b) Gain due to supplemental plan asset earnings in excess of 5%	288,000
	(c) Net gain due to other actuarial gains and losses*	311,400
	(d) Loss due to early retirement subsidy for retirement prior to 65	(26,000)
	(e) Net actuarial gain ((a) + (b) + (c) + (d))	574,600

* Due primarily to actuarial gains from mortality and turnover, offset by a loss from earnings in excess of 5% on female account balances subject to unisex adjustment.

Table 6

UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN

Comparison of 1986 and 1987 Valuation Results

		1986	1987
1.	Active Pre-1963 Participants		
	(a) Total active pre-1963 participants under FRP	313	289
	(b) Total projected to receive supplemental benefits		
	(i) Number	1	1
	(ii) Average annual supplemental benefit 1/	2,516	1,594
2.	Estimated account balance for female participants with account balance prior to July 1, 1982	31,804,974	30,166,331
3.	Retirees, Survivors and Widows		
	(a) Number - Retirees	441	427
	- Survivors	55	60
	- Widows	17	13
	- Total	513	500
	(b) Average annual benefit being paid or payable	2,604	2,523
4.	Accrued Liability on Valuation Date		
	(a) Active participants	18,400	12,700
	(b) Retirees, survivors and widows	10,801,600	10,124,800
	(c) Female participants with account balances prior to July 1, 1982	3,289,300	3,144,900
	(d) Total	14,109,300	13,282,400
5.	Assets on Valuation Date	7,522,600	8,948,400
6.	Unfunded Accrued Liability	6,586,700	4,334,000
7.	Annual Normal Cost	74,300	69,000
8.	Chapter 356 Minimum Provision	510,700	361,900
9.	Alternate Provision-Current Disbursement	1,336,000	1,261,400

1/ Per actuarial assumptions regarding earnings on FRP account balances, salary increases and increases in Social Security. See Table 4 for summary of actuarial assumptions.

1986

UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN

Actuarial Valuation
as of June 30, 1986

January 13, 1987

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UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN

Actuarial Valuation as of June 30, 1986

PURPOSE AND SUMMARY

The purpose of this report is to set forth the results of our actuarial valuation of the University of Minnesota Supplemental Benefits Plan as of June 30, 1986 in accordance with Chapter 356 of the Minnesota Statutes. The valuation has been based on employee census data as of June 30, 1986 and plan provisions in effect as of June 30, 1986. In summary, our valuation reveals a Chapter 356 requirement of $510,700, well short of the $1,336,000 of annual benefits payable to retirees as of the valuation date.

The plan is composed of two distinct groups:

- Employees who began participation in the Faculty Retirement Plan prior to 1963. This is essentially a closed group of participants; namely, existing retirees and a diminishing group of active participants soon to retire.
- Female participants in the Faculty Retirement Plan for whom contributions to FRP were made at any time prior to July 1, 1982. A few of these participants are already retired, however, most are still active. This is also a closed group.

A detailed description of plan benefits is presented in Tables 3(a), 3(b) and 3(c).

Significant benefit improvements were made during the plan year:

- A benefit increase was granted as of July 1, 1986 to retirees, and survivors of retirees, who retired on or before July 1, 1985. The amount was based on both years of service and years since retirement.
- A cost of living increase was granted as of January 1, 1986 to widows of pre-1956 retirees, raising their annual benefits from $4,176 to $4,464.

Since appropriate projections would substantiate the diminishing nature of benefits payable under this program, any attempt to fund it strictly in accordance with the Statutes would prove to be meaningless. That is, a funding approach in strict accordance with Chapter 356 would result in a negative cash flow since current disbursements exceed resulting Chapter 356 contribution requirements.

As noted in prior reports, normal anticipated attrition of the covered group, combined with payment of current benefits from external sources, will indirectly fund the unfunded accrued liability at a rate more rapid than that prescribed under the Statutes. As set forth later in Table 6 of the report, the indirect method of funding through payment of current benefits, in conjunction with additional contributions to the plan (total amounts are substantially in excess of Chapter 356 requirements), resulted in a reduction of the unfunded accrued liability under the plan from $6,595,300 as of June 30, 1985 to $4,727,900 as of June 30, 1986. The benefit improvements granted during the year increased the unfunded accrued liability by $1,858,800 to $6,586,700.

EMPLOYEE AND FINANCIAL DATA

We received complete data covering 313 active pre-1963 participants under the Faculty Retirement Plan. Based on current account balances and the actuarial assumptions set forth below, it is projected that one member of this group would receive benefits from the Supplemental Benefits Plan. In addition, we were furnished a listing for the 513 retirees, survivors and widows presently receiving or eligible to receive benefits under the plan. We also received a summary by age grouping of account balances under the Faculty Retirement Plan for female participants at October 30, 1986. From this data we estimated the total account balances as of June 30, 1986 subject to unisex adjustment. All of this data as utilized for valuation purposes is summarized in Table 2 of this report.

Assets of $7,522,600 as of June 30, 1986 were reported to us by the University, including 1986 plan year contributions, in addition to current disbursements made from general funds, totalling $700,200.

PLAN VALUED

Since benefits under this program are directly dependent on the level of benefits payable under the University's Faculty Retirement Plan, in addition to summarizing the pertinent provisions of the Supplemental Benefits Plan (pre-June 30, 1977 and post-June 30, 1977 in Tables 3(a) and 3(b), respectively) we have set forth a complete description of the principal provisions of the FRP plan in Table 3(c).

In brief, effective for retirement on or after June 30, 1977, the University adopted the revised "50%" formula as the target for supplemental benefits (as outlined in Table 3(b)) while at the same time retaining the prior formula as a "minimum" measure of benefits payable.

This report continues to reflect the revised early retirement provision that became effective on June 30, 1978 to coordinate with the current treatment of early retirees under the Faculty Retirement Plan (FRP benefits are currently payable immediately upon early retirement between ages 62 and 65, and the University no longer continues to make FRP contributions to an early retiree). Thus, on early retirement, benefits are payable immediately from the supplemental plan and are determined as follows:

(i) the 1-2/3% "target benefit" is projected to age 65

(ii) the FRP annuity equivalent and Social Security are both determined as payable immediately.

(iii) the benefit payable immediately is the difference between (i) and (ii).

This approach introduces an additional cost over what had been recognized in years prior to June 30, 1978, primarily attributable to the entire benefit being payable from this plan up to age 65 (previously these costs were charged back to the member's department outside the plan).

Recognizing these additional costs which emerge as participants retire early (we assume that members retire at age 66, on the average), the plan funds are reimbursed for the portion of total current disbursements representing these additional payments.

We continue to recognize benefit increases granted to retirees ($600 per year on a life annuity basis and $480 on a joint and survivor basis) effective July 1, 1981 and July 1, 1984, cost of living increases granted to widows of pre-1956 retirees effective July 1, 1981 (from $3,330 to $4,020 per year) and July 1, 1984 (from $4,020 to $4,176 per year), and supplemental benefits granted female participants in the FRP plan based on contributions made prior to July 1, 1982.

This valuation also recognizes an additional increase granted effective July 1, 1986 to those who retired on or before July 1, 1985 and an additional cost-of-living increase for pre-1956 widows granted effective January 1, 1986 (from $4,176 to $4,464 per year).

ACTUARIAL ASSUMPTIONS AND METHODS

The actuarial assumptions and methods employed in this valuation are outlined in Table 4 of this report. These assumptions and methods conform to those provisions of Chapter 356 of the Minnesota Statutes.

The actuarial method utilized is the entry-age-normal cost method as prescribed by Statutes. Under this method, the normal cost is determined as the level percentage of future covered payroll which would be required to be paid from each member's date of employment to retirement in order to provide the benefits under the plan. The accrued liability under this method is equal to the present value of all benefits payable under the plan less the present value of future normal costs calculated in accordance with the actuarial cost method. The unfunded accrued liability is then determined by subtracting the assets on the valuation date from the accrued liability. Minnesota Statutes call for annual normal costs to be provided in addition to the amortization of unfunded accrued liabilities as of the first valuation made after June 1, 1979 by the end of the fiscal year occurring in 2009. The amortization of the additional unfunded accrued liability generated by benefit improvements is determined by first computing the amortization over 30 years. The amount of this amortization is added to the amortization of the June 1, 1979 amount and a determination is made of the fiscal year when this combined payment will have fully funded the total unfunded accrued liability. Due to the increases in benefits which have occurred since 1979, all unfunded accrued liabilities are being amortized by the end of the fiscal year occurring in 2012.

Actuarial assumptions were identical to those used in the prior year and reflect the current Social Security Law. As indicated, the amount of benefits provided under the supplemental plan are directly dependent on those benefits provided under the FRP plan. Thus, in order to appropriately determine projected benefits payable, advance assumptions were also made in regard to future projections under the FRP itself; namely, that contribution levels would continue in accordance with the salary scale assumption set forth in item 5 of Table 4. For this purpose, fund balances were projected assuming a return of 5% per annum with accumulated values converted to annuity benefits on the basis of a continuation of purchase rates utilized in 1975. This maintains a degree of conservatism in the valuation, since current annuity purchase rates (which, effective July 1, 1986 are based on an assumed interest rate of 10%) applied to determine offsetting FRP benefits are more favorable than those used in 1975 (which are based on an assumed interest rate of 6¼%). Utilization of this more conservative basis for valuation purposes is consistent with the salary/investment return described below.

It should be noted that the combined salary/investment return assumptions of 3½%/5% are prescribed by Statute and do not anticipate future increases of an inflationary nature. In fact, to the extent that salaries increase more than 3½% and basic FRP accumulations take place at a rate in excess of 5%, the increased level of FRP benefits would serve to diminish supplemental benefits payable from the plan. Any future increases in offsetting Social Security benefits will also serve to reduce supplemental benefits payable from the plan under the post June 30, 1977 formula.

With regard to the account balances for female participants which are subject to unisex adjustment it should be noted that any interest earnings in excess of the assumed rate of 5% will serve to increase the liability for this group.

VALUATION RESULTS

The results of our valuation are set forth in Table 1. Section A of the table sets forth basic data items relative to active and retired (including survivors and widows) participants.

Section B sets forth the determination of accrued liability, unfunded accrued liability, annual normal cost, and annual cost provision all in accordance with Chapter 356, with the Chapter 356 annual cost provision amounting to $510,700 and the current disbursement requirement of $1,336,000.

GAIN AND LOSS ANALYSIS

In Table 5 we reconcile the unfunded accrued liability over the past year and set forth a gain and loss analysis. This analysis denotes a decrease of $357,500 in the June 30, 1986 unfunded accrued liability when compared to that expected. Actuarial gains resulted primarily from earnings in excess of 5% on supplemental plan assets and FRP accumulations, from late retirements, and from increases in projected Social Security benefits. These gains were partially offset by actuarial losses resulting from early retirements and from earnings in excess of 5% on female account balances subject to unisex adjustment.

COMPARISON OF 1985 and 1986 VALUATION RESULTS

In Table 6, we set forth a comparison of the principal values underlying the 1985 and 1986 valuations. The unfunded accrued liability has decreased from $6,595,300 to $4,727,900 before recognition of the benefit increases granted during the year. The benefit improvements increased the unfunded liability to $6,586,700.

* *

If in connection with this report, any further investigations are indicated, we will be happy to proceed as directed.

Respectfully submitted,

THE WYATT COMPANY

Jerome J. McKoskey
Thomas F. Del Fiacco

Jerome J. McKoskey, F.S.A.
Consulting Actuary

Thomas F. Del Fiacco
Consultant

Minneapolis/St. Paul
January 13, 1987

Table I

UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN

Actuarial Valuation as of June 30, 1986
(Valuation determinations rounded to nearest $100)

A. BASIC DATA

1.	Active Pre-1963 Participants	
	(a) Total active pre-1963 participants under Faculty Retirement Plan (FRP)	313
	(b) Total projected to receive supplemental benefits	
	(i) Number	1
	(ii) Average annual projected supplement 1/	2,516
2.	Estimated Account Balance for Female Participants at July 1, 1986	31,804,974
3.	Retirees, Survivors and Widows	
	(a) Number receiving or entitled to receive benefits	513
	(b) Average annual benefit being paid	2,604

B. DETERMINATION OF ANNUAL REQUIREMENTS IN ACCORDANCE WITH CHAPTER 356 (MINNESOTA STATUTES)

1.	Accrued Liability as of June 30, 1986	
	(a) Actives	18,400
	(b) Retirees	9,080,300
	(c) Widows	342,300
	(d) Survivors	1,379,000
	(e) Female unisex increase 7/1/82	3,289,300
	(f) Total	14,109,300
2.	Assets as of June 30, 1986	7,522,600
3.	Unfunded Accrued Liability as of June 30, 1986 (1(f) less 2)	6,586,700
4.	Annual Normal Cost	74,300

THE Wyatt COMPANY

5.	Annual Requirement to Fund Normal Cost and Amortize the Unfunded Accrued Liability by June 30, 2012	
	(a) Amortization of Unfunded Accrued Liability by June 30, 2012	436,400
	(b) Normal cost	74,300
	(c) Total	510,700
6.	Annual Rate of Benefit Payment	1,336,000

1/ Per investment earnings, salary scale, and Social Security assumptions summarized in Table 4.

Table 2

UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN

Distribution of Participants as of June 30, 1986

A. ACTIVE PARTICIPANTS (Pre-1963 FRP Participants)

Age Group Last Birthday	Males	Females	Total
50 - 54	19	2	21
55 - 59	95	2	97
60 - 64	118	16	134
65 & Over	60	1	61
Total	292	21	313

B. WIDOWS OF PRE-1956 RETIREES

Age Group Last Birthday	Number (All Females)	Annual Benefit Being Paid
75 - 79	3	$ 13,392
80 - 84	1	4,464
85 - 89	4	17,856
90 & Over	9	40,176
Total	17	$ 75,888

C. SURVIVORS

Age Group Last Birthday	Number (All Females)	Annual Benefit Being Paid
55 - 59	2	$ 5,941
60 - 64	2	1,641
65 - 69	6	15,691
70 - 74	17	45,773
75 - 79	21	68,070
80 - 84	2	4,457
85 - 89	5	18,541
Total	55	$ 160,114

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D. RETIREES

Age Group Last Birthday	Males	Females	Total	Annual Benefit Being Paid
55 - 59	-	-	-	$ -
60 - 64	7	14	21	16,998
65 - 69	55	24	79	104,026
70 - 74	116	35	151	250,050
75 - 79	80	13	93	298,779
80 - 84	46	13	59	232,736
85 - 89	19	4	23	117,123
90 & Over	8	7	15	80,326
Total	331	110	441	$1,100,038

E. RECONCILIATION OF RETIREES/WIDOWS/SURVIVORS

		Number
1.	Number receiving benefits last year	462
2.	Deaths during year with no continuing benefits payable	22
3.	New retirees this year	73
4.	Number receiving or entitled to receive benefits this year (1 - 2 + 3 = 4)	513 *

* as follows:

Widows	17
Survivors	55
Retirees	441
Total	513

F. ESTIMATED FACULTY RETIREMENT PLAN ACCOUNT BALANCES FOR FEMALE PARTICIPANTS AS OF JUNE 30, 1986 ATTRIBUTABLE TO CONTRIBUTIONS MADE PRIOR TO JULY 1, 1982

Age	Number Of Participants	Total Account Balance
25	0	$ 0
26	0	0
27	0	0
28	0	0
29	0	0
30	1	400
31	2	10,185
32	3	3,406
33	12	67,292

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Age	Number Of Participants	Total Account Balance
34	9	58,775
35	22	130,300
36	26	286,629
37	28	347,591
38	40	306,958
39	32	495,812
40	35	632,707
41	36	679,866
42	29	682,155
43	32	766,930
44	39	1,215,671
45	36	1,001,923
46	36	1,161,573
47	32	1,137,289
48	28	1,006,595
49	27	1,095,428
50	36	2,193,807
51	23	897,964
52	23	1,107,138
53	22	939,301
54	20	1,139,056
55	23	949,886
56	22	760,832
57	21	1,342,659
58	14	686,983
59	23	1,010,300
60	28	1,681,832
61	23	1,692,678
62	15	987,567
63	23	1,897,373
64	15	1,440,213
65	12	692,404
66	6	345,747
67	5	358,811
68	3	129,712
69	1	74,837
70	3	293,558
72	1	2,442
75	1	9,120
79	1	23,269
Total:	869	$31,804,974

Table 3(a)

UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN (PRE-JUNE 30, 1977)

Summary of Principal Provisions of the Supplemental Plan
(provisions in effect for pre-June 30, 1977 retirees)

1. Eligibility: Generally applicable to employees who first began participation in the Faculty Retirement Plan prior to 1963, and who retire on or after the June 30, next following the 65th birthday. Special early retirement provisions are available (see below).

2. Amount of Supplement: Supplement (annual) is computed as follows:

(a) Determine 2% of final five year average salary for each year of actual service (maximum 30), but not to exceed the following:

(i)	Professor	\$8,500
(ii)	Associate Professor	\$8,000
(iii)	Assistant Professor or Instructor	\$7,500

(b) Convert Faculty Retirement Plan net accumulations to fixed dollar life annuities using fixed annuity factors under FRP. Note that variable accumulations are converted on fixed basis for this purpose. Prior endowment accumulations are treated as annuity in this computation.

(c) Deduct \$1,524 (estimate of 1963 Social Security level) from (a).

(d) Determine supplement as equal to (a) less (b) after adjustment for (c).

(Note: Dividends payable for coverage prior to 1963 are not included in (b) above. 1963 and later coverage dividends are included by direct reflection in interest credited on accumulations).

3. Early Retirement: (Note: Any reference to age 65 in this description means the June 30th following the 65th birthday).

A member may retire as early as age 62 in which case his FRP accounts are used to purchase an annuity commencing immediately. Supplemental benefits payable are determined as follows:

(a) Determine 2% of final five year average salary for each year of service (projected to age 65 but subject to a maximum of 30) not to exceed the following:

(i)	Professor	$8,500
(ii)	Associate Professor	$8,000
(iii)	Assistant Professor or Instructor	$7,500

(b) Convert Faculty Retirement Plan net accumulations to fixed dollar life annuities payable at early retirement using annuity factors under FRP. Note that variable accumulations are converted on a fixed basis for this purpose.

(c) Deduct $1,524 (estimate of 1963 Social Security level) from (a).

(d) Determine supplemental benefit as equal to (a) less (b) after adjustment for (c).

Table 3(b)

UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN (JUNE 30, 1977)

Summary of Principal Provisions of the Supplemental Plan
(provisions in effect for June 30, 1977 and later retirees)

1. Eligibility: Generally applicable to employees who first began participation in the Faculty Retirement Plan prior to 1963, and who retire on or after the June 30, next following the 65th birthday. Special early retirement provisions are available (see below).

2. Amount of Supplement: Greater of benefit as determined under Supplemental Benefits Plan (Pre-June 30, 1977) or benefit computed as follows:

(a) Determine final five year average salary subject to following maximums for indicated retirement years:

Year	Amount	Year	Amount	Year	Amount
1976-77	$37,200	1981-82	$45,300	1986-87	$55,100
1977-78	38,700	1982-83	47,100	1987-88	57,300
1978-79	40,300	1983-84	49,000	1988-89	59,600
1979-80	41,900	1984-85	51,000	1989-90	62,000
1980-81	43,600	1985-86	53,000	1990-91	64,500

(b) Determine 1-2/3% of final five year average salary for each year of actual service (maximum 30).

(c) Convert Faculty Retirement Plan net accumulations to fixed dollar life annuities using fixed annuity factors under FRP. Note that variable accumulations are converted on fixed basis for this purpose.

(d) Determine 100% of estimated primary Social Security benefit payable based on continuous coverage from date of University hire (or January 1, 1955, if later), to the date of retirement.

(e) Determine supplement equal to the excess of (b) over the sum of (c) plus (d).

3. Early Retirement:
(Note: Any reference to age 65 in this description means the June 30th next following the 65th birthday).

A member may retire as early as age 62 in which case his FRP accounts are used to purchase an annuity commencing immediately. Supplemental benefits payable are determined as follows:

(a) Determine final five year average salary subject to the following maximums based on the year of early retirement:

Year	Amount	Year	Amount	Year	Amount
1978-79	$40,300	1982-83	$47,100	1986-87	$55,100
1979-80	41,900	1983-84	49,000	1987-88	57,300
1980-81	43,600	1984-85	51,000	1988-89	59,600
1981-82	45,300	1985-86	53,000	1989-90	62,000

(b) Determine 1-2/3% of final five year average salary for each year of actual service, including projected service to age 65 (maximum 30).

(c) Convert Faculty Retirement Plan net accumulation to fixed dollar annuities using fixed annuity factors under FRP and reflecting early retirement. Note that variable accumulations are converted to the fixed basis for this purpose.

(d) Determine 100% of estimated primary Social Security benefit payable at early retirement based on continuous coverage from date of University hire (or January 1, 1955 if later) to the date of retirement.

(e) Determine supplement equal to the excess of (b) over the sum of (c) plus (d).

4. Unisex Adjustment Policy Established July 1, 1982:

Periodic retirement benefits paid pursuant to the Faculty Retirement Plan shall be equalized for similarly situated males and females effective July 1, 1982. To the extent that benefits in addition to those which are available from the annuity contracts shall be required, such amounts shall be paid through the University of Minnesota Supplemental Benefits Plan.

The equalization shall be accomplished in the following manner:

For Individuals Not Yet Retired:

1. All contributions to the faculty retirement plan after the effective date shall be applied to purchase annuities under sex-neutral (unisex) rates.

2. Total benefits (annuities plus supplement) from contributions to the faculty retirement plan which are made prior to the effective date shall be determined by using male mortality rates for all University employees and female mortality rates for all joint annuitants under the joint and survivor option.

For Individuals Already Retired:

The amount of the total periodic benefit (annuity plus supplement) being paid shall be recalculated using male mortality rates for all University employees and female mortality rates for all joint annuitants under the joint and survivor option. In those instances where the application of such mortality rates provides for increased benefits, such increased benefits shall be paid through the University supplement on a retroactive and prospective basis.

5. Post-Retirement Benefit Increase Established July 1, 1984:

Increases granted to certain retired faculty in the amount of $600 for a full share and $480 for an 80% share with full shares being paid to those retirees who are receiving single life annuities and 80% shares paid to retirees, or surviving spouses of retirees, who elected the survivorship option. Those retired faculty eligible to receive the increase shall be determined as follows:

1. Exclude Vice Presidents, Widows of Vice Presidents, and those with Dean status for retirement purposes.

2. Include only pre-1963 participants, who retired on or before June 30, 1983 and who are not specifically excluded, whether or not they are currently receiving a Supplement payment. 1969 and later surviving spouses currently receiving a Supplement are considered participants.

6. <u>Post-Retirement Benefit Increase Established July 1, 1986:</u>

Benefit increases were granted to pre-1963 participants who retired not later than July 1, 1985, excluding those Vice Presidents and Deans who qualified for special benefits, but including surviving spouses of retirees who elected the survivorship option. The amount of increase was $13.00 (single life annuities) or $10.40 (joint and survivor or surviving spouse annuities) per year for each "point," where one point was awarded for each year of service up to 30 years and 1½ points were awarded for each year since retirement. The value of a point was determined by the amount of funds available in the department budget for increases.

Table 3(c)

UNIVERSITY OF MINNESOTA
FACULTY RETIREMENT PLAN

Summary of Principal Provisions of the Faculty Retirement Plan

1. Eligibility:

All full time academic staff members (including certain civil service staff members) participating in $20,000 Group Life program, eligible to participate as follows:

Classification	Date of Participation
(a) Associate professor or higher	(i) If hired between October 1 and April 2, on date of hire. (ii) If hired between April 2 and September 30, on October 1 next following date of hire.
(b) Assistant professor or research associate	On October 1 following two years of service. If hired between October 2 and March 1, service is credited back to prior to October 1.
(c) Instructor or research fellow	On October 1 following three years of service. If hired between October 2 and March 1, service is credited back to prior October 1.
(d) Professional and Administrative	(i) If salary less than $32,367, same as (c).* (ii) If salary greater or equal to $32,367 but less than $38,886, same as (b). (iii) If salary greater than or equal to $38,886 same as (a). * Salary ranges July 1, 1985 to June 30, 1986.

2. Financing:

Staff member contributes 2½% of gross annual salary, with University making contributions of 2½% of the first $5,000 of gross annual salary, plus 13% of such gross annual salary in excess of $5,000. Effective in 1973, summer research and training grants have been included for nine-month appointees for the purposes of determining compensation for contributions.

3.	Mandatory Retirement Age:	June 30 following 70th birthday.
4.	Date to Which University Contributions are Made:	For staff member beginning participation on October 2, 1974 and later, contributions are continued until the June 30 next following the 65th birthday; otherwise continued during eligible employment until June 30 next following 68th birthday.
5.	Investment Medium (Pre-Retirement):	Contributions are accumulated through the medium of insured funding contracts as follows: (i) Fixed dollar: accumulate at rate of interest declared by insurers, but never less than minimum stipulated. Only future accumulations transferable to variable in pre-retirement period. (ii) Variable Income: Net contributions are immediately converted to accumulation units which are valued each month. Unit values reflect earnings of separate account less the fixed investment charge stipulated (subject to guaranteed maximum charges). Past and future accumulations are transferable to fixed in pre-retirement period. (NOTE: Variable contributions cannot exceed 50%, or alternatively 75% of total contributions, including employees' contributions).
6.	Types of Annuities Available at Retirement (Post-Retirement):	Either guaranteed fixed retirement annuities or non-guaranteed variable annuities are provided (see (7) for conversion). Fixed funds cannot be converted to variable annuity basis at retirement although variable fund conversion to fixed annuity is allowed in which case, accumulation units would be cancelled and transferred to the general assets of the insurer to be applied to provide guaranteed retirement annuity coverage.
7.	Amount of Benefits:	At retirement, the cash value (representing accumulation of contributions under insured funding contracts, or value of accumulation units under variable), is applied to provide "life only" retirement income on the basis of stipulated income conversion factors as listed below. In the determination of the monthly income on the "fixed income" basis, a $200 set-up charge is deducted from the proceeds prior to application of the "fixed income" factor. Account balances resulting from contributions made prior to July 1, 1982 will be applied on a male employee and female joint annuitant basis. Account balances resulting from contributions made subsequent to July 1, 1982 will be applied on a unisex basis.

7/1/86 Conversion Basis	Monthly Income for Each $1,000 of Proceeds: Fixed Income (11½% interest net) Age 65	Fixed Income (11½% interest net) Age 68	Variable Annuity (4% interest net) Age 65	Variable Annuity (4% interest net) Age 68
Pre-10/1/76 contributions:				
Male	10.75	11.48	7.18	7.95
Female	9.85	10.35	6.37	6.95
Contributions after 10/1/76 and prior to 7/1/82:				
Male	10.75	11.48	7.08	7.83
Female	9.85	10.35	6.13	6.66
Contributions 7/1/82 and later:				
Unisex:	10.17	10.75	6.47	7.08

(NOTE: In the past when fixed income conversion factors proved to be too conservative, excess interest credits were being accorded to benefits in payment status via year-end dividends. Certain prior retirees are still being credited with excess interest dividend increases).

8. Early Retirement: Participants may retire early, with annuity equivalents payable immediately.

9. Vesting (termination value): Immediate 100% vested right in accumulations to date of termination. Disposition is as follows:

(i) If initial participation is December 15, 1972 or earlier, or after December 15, 1972 and has less than five years of participation, entitled to receive total net accumulation to date of termination.

(ii) If initial participation is after December 15, 1972 and has more than five years participation, entitled to sum of:
   (a) His or her own contributions plus interest, and
   (b) Paid-up annuity for remainder of total net accumulation, providing for death benefits prior to income commencement of remaining paid-up values.

(NOTE: Variable portion of net accumulation, if $2,000 or more, may be applied to provide variable retirement annuity, or alternatively placed in paid-up status to provide variable retirement annuity at later date. In addition, terminating member can continue retirement annuity accumulations by paying total premiums directly to the insurer).

10. Death Benefits:
(a) Pre-retirement:

Named beneficiary would receive total termination value of retirement annuity as in (9). Optional forms of payment as may be elected by beneficiary must be approved by the University.

(b) Post-retirement:

In accordance with optional form of payment elected, as follows:
(i) life annuity with no post-retirement death benefit.
(ii) life annuity with 60, 120, 180, or 240 monthly payments guaranteed in any event.
(iii) joint and 100% survivor annuity with 120 monthly payments guaranteed payable in any event.
(iv) joint and 66-2/3% to survivor annuity with 120 monthly payments guaranteed payable in any event.

11. Disability:

In the event of total and continuous disability for a period of at least four months, all contributions are waived with future credits being accorded on the basis of a continuation of contribution levels in effect at time of disability.

Table 4

UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN

Summary of Actuarial Assumptions and Methods

1.	Mortality:	Progressive Annuity Mortality Table set back 0.6 for males and 4.6 years for females.
2.	Turnover:	None assumed.
3.	Expenses:	None assumed. To be met directly.
4.	Interest Rate:	5% per annum.
5.	Salary Scale:	3½% per annum.
6.	Assumed Retirement Age:	June 30th following 66th birthday.
7.	Actuarial Cost Method:	Individual entry-age-normal cost method, with normal cost determined as a level percentage of future covered payroll.
8.	Amortization of Unfunded Accrued Liability:	As a level dollar amount by June 30, 2012.
9.	Faculty Retirement Plan Accumulations:	Accumulated at 5% per annum assuming a continuation of present contribution percentages on increasing covered payroll (per salary scale assumption). Net accumulations converted to fixed dollar life annuities using following 6¼% factors (monthly income for each $1,000 of proceeds). Male 8.65 Female 7.64 Unisex 8.55
10.	Social Security:	Based on present law and 3½% salary scale applicable to current salaries. No wage base or cost of living increases are projected.

Table 5

UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN

Gain and Loss Analysis (Plan Year Ending June 30, 1986)

1.	Unfunded Accrued Liability as of June 30, 1985	$6,595,300
2.	Normal Cost	64,100
3.	Interest at Valuation Rate (5%) on (1) and (2)	333,000
4.	Contributions During Year	
	(a) Approximate "pay-as-you-go" payments to retirees	1,160,300
	(b) Supplemental contributions	700,200
	(c) Total effective contributions ((a) + (b))	1,860,500
5.	Interest at Valuation Rate (5%) on 4(a) and 4(b)	46,500
6.	Increase in liability due to benefit improvements	1,858,800
7.	Expected Unfunded Accrued Liability as of June 30, 1986 (1 + 2 + 3 - 4 - 5 + 6)	6,944,200
8.	Actual Unfunded Accrued Liability as of June 30, 1986	6,586,700
9.	Actuarial Gain During Year (7 - 8)	357,500
10.	Gain and Loss Analysis	
	(a) Gain due to increase to offsetting Social Security benefits	3,900
	(b) Gain due to supplemental plan asset earnings in excess of 5%	316,100
	(c) Gain due to late retirements	7,000
	(d) Net gain due to other actuarial gains and losses*	38,100
	(e) Loss due to early retirement subsidy for retirement prior to 65	7,600
	(f) Net actuarial gain ((a) + (b) + (c) + (d) - (e))	357,500

* Due primarily to gain from earnings in excess of 5% on FRP accumulations, offset by loss from earnings in excess of 5% on female account balances subject to unisex adjustment.

Table 6

UNIVERSITY OF MINNESOTA
SUPPLEMENTAL BENEFITS PLAN

Comparison of 1985 and 1986 Valuation Results

		1985	1986 2/	1986 3/
1.	Active Pre-1963 Participants			
	(a) Total active pre-1963 participants under FRP	380	313	313
	(b) Total projected to receive supplemental benefits			
	(i) Number	4	1	1
	(ii) Average annual supplemental benefit 1/	1,105	2,516	2,516
2.	Estimated account balance for female participants with account balance prior to July 1, 1982	27,567,348	31,804,974	31,804,974
3.	Retirees, Survivors and Widows			
	(a) Number - Retirees	396	381	441
	- Survivors	45	55	55
	- Widows	21	17	17
	- Total	462	453	513
	(b) Average annual benefit being paid or payable	2,644	2,483	2,604
4.	Accrued Liability on Valuation Date			
	(a) Active participants	43,700	18,400	18,400
	(b) Retirees, survivors and widows	9,917,600	8,942,800	10,801,600
	(c) Female participants with account balances prior to July 1, 1982	2,813,800	3,289,300	3,289,300
	(d) Total	12,775,100	12,250,500	14,109,300
5.	Assets on Valuation Date	6,179,800	7,522,600	7,522,600
6.	Unfunded Accrued Liability	6,595,300	4,727,900	6,586,700
7.	Annual Normal Cost	64,100	74,300	74,300
8.	Chapter 356 Minimum Provision	501,100	393,800	510,700
9.	Alternate Provision-Current Disbursement	1,221,700	1,124,700	1,336,000

1/ Per actuarial assumptions regarding earnings on FRP account balances, salary increases and increases in Social Security. See Table 4 for summary of actuarial assumptions.

2/ Prior to recognition of post-retirement benefit increases granted during the year.

3/ After recognition of post-retirement benefit increases granted during the year.