

Benefit Services / Consulting Actuaries

October 20, 1977

Mr. B. B. Allen Commissioner of Administration State of Alaska Department of Administration Pouch CR Juneau, Alaska 99811

Dear Commissioner:

At your request, we have completed an actuarial valuation of the Alaska Teachers' Retirement System as of June 30, 1977, in order to examine the financial status of the System and to determine the Employer-State contribution rates for the 1978-79 year.

The results of our valuation are included in this report, based upon employee data and financial information supplied by your department.

On the basis of this data and the actuarial method and assumptions described in this report, I certify that to the best of my knowledge and belief, the attached statements are true and correct.

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Respectfully submitted,

Robert F. Richardson, MAAA Assistant Vice President

RFR:jn

Attachment

William M. Mercer, Incorporated

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SECTION I

SUMMARY OF THE VALUATION

This report presents the results of the actuarial valuation of the Alaska Teachers' Retirement System as of June 30, 1977. It is based upon actuarial assumptions and methods which are identical to those used in the prior valuation. The more significant results are as follows:

Contribution Rates

Contribution rates as a percent of earnings have decreased slightly, primarily due to greater than anticipated investment yields during the year. The following table summarizes those rates.

		Valuation <u>6-30-76</u>	Date 6-30-77) a sole
(1)	Basic System	12.43%	12.24%	Security 15/5
(2)	Medical Benefit	.63%	.62%	Appropri
(3)	Total Employer-State Contribution Rate	13.06%	12.86%	

Funding Progress

One of the best measures of a pension plan's funding progress is the growth of assets relative to the present value of accrued benefits. The greater-than-assumed investment yield of the fund during 1976/77 more than offset the effect of rapid growth in salaries during the year, thus leading to an increase in the

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accrued benefit funding ratio. The improvement in this ratio was dampened by the 10% PRPA which became effective July 1, 1977, thereby increasing liabilities by \$6,235,843.

		Valuati 6-30-76	ion Date 6-30-77
(1)	Valuation Assets	\$134,471,807	\$182,062,858
(2)	Present Value of Accrued Benefits	244,460,953	315,383,056
(3)	Accrued Benefit Funding Ratio	55.0%	57.7%

A more complete analysis of this actuarial valuation appears in the following sections.

SECTION 2

ANALYSIS OF THE VALUATION

A. Actuarial Assumptions

The actuarial assumptions used in this valuation, as described in Appendix 1, are identical to those used in the prior valuation of the System. Except for changes caused by amendments to the System, the actuarial assumptions have remained unchanged since the June 30, 1972 actuarial valuation report. Since that time, there have been changes in the economy which significantly affect benefits and costs under the System. Most notable has been the persistently high level of inflation, resulting in both higher salaries and higher investment yields from the fund. In view of these changes, we would recommend that all actuarial assumptions and methods be reviewed at this time. We present the following for your consideration:

(1) Interest

More than 80% of the Teachers' Retirement Fund is in fixed income investments with medium to long-range maturity dates and relatively high yields. Consequently, the interest received from the fund can be expected to remain at high levels for several years. During 1976, the income of the total fund provided a time weighted return rate of 6.91%. Appreciation brought in another 8.02%, resulting in a total time weighted return rate

for the year of 14.92%. Obviously, that was a very good year for investments which may not be repeated.

Also, it must be remembered that the actuarial interest assumption is intended to reflect the long-term yield of your fund. In view of the present, high yielding composition of your fund, and in view of the anticipated long-term return rates that your fund should achieve, it is our recommendation that you consider increasing the interest assumption to 6% per year.

(2) <u>Salary Scale</u>

The present salary scale, which provides for 4% increases in salaries up to age 39, 2% per year from 40 to 49, and 1% thereafter is clearly inadequate in reflecting salary trends of the last several years. In an attempt to more clearly reflect current pay patterns, we would recommend a salary scale of 7% per year until age 39, 6% from 40 to 49, and 5% thereafter.

(3) Mortality

Several years of experience are necessary before credible mortality experience can be developed. While the present mortality assumptions may be appropriate, we recommend adoption of the 1971 Group Annuity Mortality Table.

The 1971 GAM is the most recent group annuity table published by the Society of Actuaries; it is intended to reflect mortality experience of retirement plans in the United States. In comparison to your present mortality assumption (the 1951 Group Annuity Mortality Table with projection "C" to 1965), the 1971 GAM assumes slightly greater longevity, especially at the higher ages. Mortality experience in group insurance plans covering Alaskan employees consistently indicates a higher level of mortality than what might be anticipated in the "lower 48". However, until such experience is proven for this System, it is our recommendation that the more recent mortality table be adopted.

(4) <u>Turnover</u>

For several years now the employee data which we have received for valuation purposes has been of sufficient quantity and quality to perform experience studies on the actual turnover experience under the System. It is our recommendation that such an experience study be undertaken in order to develop turnover rates which will reflect the actual experience under the System.

(5) Disability

As part of the experience study indicated above, we would recommend that the actual disability experience of the

System be reviewed with an eye toward adjusting the present disability incidence assumption. It is our recommendation that post-disability mortality rates be based upon the tables recently published by the Pension Benefit Guaranty Corporation which reflect mortality of those receiving Social Security Disability Benefits. These rates are based partly upon unpublished data compiled by the Social Security Administration derived from 1957-66 termination rates, adjusted for actual experience to 1973.

(6) Retirement Age

We would recommend no change in the retirement age assumption presently being used. During the 1976/77 plan year, the average age at retirement for the 215 new retirees during the year was 55.97. Our actuarial assumption pertaining to the retirement age of the 7,024 active members resulted in an average projected retirement age of 55.90.

(7) Contribution Refund

Our present assumption is that 50% of those terminating with vested benefits after age 40 will retain their deferred vested benefit while all other participants will take their contributions; this may be somewhat liberal. We would recommend that this important actuarial assumption be reviewed in the suggested experience study.

(8) C.O.L.A.

We are assuming that 40% of the now active members will be eligible for the cost of living adjustment when (and if) they receive retirement benefits under this System. The percentage of retirees who actually receive C.O.L.A. has been increasing over the last few years to its present level of 49%. However, recent changes concerning residency requirements for C.O.L.A. may cause a downturn in this percentage. It is our recommendation that the assumed percentage of retirees who will receive cost of living adjustments in the future be adjusted, automatically each year, to reflect the actual experience of the retirees at that time.

B. <u>Actuarial Methods</u>

(1) <u>Contribution Rates</u>

The most important requirements of any actuarial method and set of actuarial assumptions is that they produce a stable contribution rate as a percentage of pay and that funding progress be maintained. The following table indicates total contribution rates developed in the last several actuarial valuation reports. Two contribution rates are shown in each year during which legislation caused an increase in benefits. Contributions in any given column reflect essentially the same plan provisions.

Valuation Date	Total	Contribu	tion Rate	
6-30-70 6-30-71 6-30-72 6-30-73 6-30-74 6-30-75 6-30-76 6-30-77	9.23	10.24	11.21 12.04 12.45	14.09 13.06 12.86

As the table indicates, when the effects of legislation are ignored, rates generally increased between June 30, 1970 and June 30, 1974. Since that time, they have decreased. This pattern of contribution rates very closely follows the investment performance of your fund during this period. In other words, during years with poor investment performance, contribution rates tended to increase while the opposite was true during the last two years when investment performance was good.

(2) Funding Progress

Another important indication of the adequacy of actuarial methods and assumptions is the progression of funding ratios. The following table shows funding ratios since the June 30 1970 valuation report. Again, funding ratios within a given column reflect the same plan provisions. For example, during 1974, an amendment to the System decreased the funding ratio from 53% to 50%. Since that time, the funding ratio has increased rather smoothly by about 2 1/2% per year.

Valuation Date		Funding	Ratios	
6-30-70 6-30-71 6-30-72 6-30-73 6-30-74 6-30-75 6-30-76 6-30-77	43%	NA 57%	NA 57% 53%	50% 55% 58%

(3) Conclusions

As the above two tables indicate, except for the effects of legislation, funding progress has been achieved while contribution rates have remained relatively level. Consequently, the overall method and assumptions have been valid and have met the funding objectives. Although the present method of spreading all liabilities over 14 years has been proven to meet funding objectives for the System, we recommend a change to a more conventional actuarial method. The present method is not widely used in either the public of private sectors. The more familiar actuarial methods develop a cost of benefits earned during the year plus a cost to amortize the past service liability. In recognition of its common usage in the actuarial profession, we recommend that you adopt the Attained Age Normal actuarial cost method.

C. Member Data

Although the number of teachers for whom we had no birth-date information increased this year, the overall quality of the data is quite satisfactory. As can be seen in Exhibit 3, both the average age and average credited service of the active members have decreased for the second straight year. This phenomenon is to be expected whenever there is a large increase in the number of members. For the second straight year, the number of active members increased by more than 800.

The average annual salary of all members increased 7.6% to \$22,887. However, actual increases in earnings for members who were active last year were greater than 7.6%. This is because the new entrants had lower average salaries and thus decreased the overall average annual salary.

Both the number of retirees and their average monthly benefit continue to rise. The \$861 per month average monthly benefit shown in Exhibit 3 reflects the 10% PRPA which became effective July 1, 1977.

D. Results of the Valuation

As indicated previously, this year's valuation shows a slight increase in the funding ratio from 55.0% to 57.7%.

The total Employer-State contribution rate declined slightly from 13.06% to 12.86%. This decrease in contribution rate is the result of a greater than anticipated investment performance and a decrease in average age, combining to more than offset the large increase in salaries.

SECTION 3

SUMMARY AND CONCLUSIONS

The results of this valuation indicate that an Employer-State contribution rate of 12.86% for the 1978-79 fiscal year will be adequate to support the benefits of this system.

We have recommended in this report that an experience study be undertaken to develop actuarial assumptions which are more in keeping with the present economy and which are based upon the actual experience of the fund. In conjunction with a change in actuarial assumption, we have also recommended a change in actuarial methods to the Attained Age Normal method, in which the total cost is reflected as a normal cost plus a payment to amortize the unfunded accrued benefit liability.

APPENDIX 1 ACTUARIAL METHOD AND ASSUMPTIONS

Valuation of Liabilities

A. Actuarial Method - A type of Aggregate Method which spreads all unfunded liabilities as a level percent of salaries over 14 years.

B. Actuarial Assumptions -

5% per annum, compounded annually, (1) Interest net of investment expenses.

4% per annum, compounded annually (2) Salary Scale until age 39; 2% from 40 to 49; and 1% thereafter.

1951 Group Annuity Mortality Table (3) Mortality with Projection "C" to 1965.

(4) Turnover In accordance with Table 1.

(5) Disability Incidence rates in accordance with Table 2. Post-disability mortality in accordance with the 1944 Railroad Retirement experience rates.

Average of age 60 and the earliest (6) Retirement Age age for which the member would be eligible for Normal Retirement benefits.

(7) Contribution Refunds 50% of those terminating after age 40 and 8 years of membership service will receive their deferred vested

benefit; all others will take their contributions upon termination before

retirement.

(8) C.O.L.A. 40% will be eligible for C.O.L.A.

(9) Miscellaneous All members are assumed to have one minor child; husbands are assumed to be 4 years older than

their wife.

No loading for expenses. (10) Expenses

Valuation of Assets - Adjusted market basis using the three-year average relationship between market and book values.

TABLE 1

TEACHERS' RETIREMENT SYSTEM STATE OF ALASKA

SEPARATION RATES
ANNUAL RATES PER 1,000 EMPLOYEES

<u>Age</u>	Rate	Age	Rate
20	165.0	40	100.0
21	162.0	41	95.0
22	160.0	42	90.0
23	158.0	43	85.0
24	155.0	44	80.0
25	152.0	45	75.0
26	149.5	46	70.0
27	146.0	47	65.0
28	142.5	48	60.0
29	140.0	49	55.0
30	137.0	50	45.0
31	132.5	51	35.0
32	130.0	52	25.0
33	127.5	53	15.0
34	125.0	54	5.0
35 36 37 38 39	120.0 116.0 112.0 108.0 104.0		

TABLE 2

TEACHERS' RETIREMENT SYSTEM STATE OF ALASKA

DISABILITY RATES
ANNUAL RATES PER 1,000 EMPLOYEES

Age	Rate	Age	Rate
20 21 22 23 24	.70 .71 .72 .73	45 46 47 48 49	1.62 1.76 1.91 2.07 2.23
25 26 27 28 29	.75 .76 .78 .80 .82	50 51 52 53 54	2.40 2.60 2.86 3.18 3.56
30 31 32 33 34	.84 .86 .88 .90	55 56 57 58 59	4.00 4.59 5.34 6.10 7.20
35 36 37 38 39	.96 .99 1.03 1.07	60 61 62 63 64	8.43 9.75 11.30 13.05 14.90
40 41 42 43 44	1.15 1.20 1.27 1.36 1.48		

APPENDIX 2 PARTICIPANT DATA

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SYSTEM
RETIREMENT
TEACHERS
ALASKA -
STATE OF

				10TAL 214 1603 1625 1301 880 630 630 411 2533 184 18
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TE OF				ROUP 0-19 0-24 5-29 0-34 0-34 5-39 10-54 5-69 10-74 15-79 10-74

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RETIRED LIVES STATE OF ALASKA TEACHERS RETIREMENT SYSTEM

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this table do not reflect the 10% PRPA which became effective July 1, 1977.

EXHIBIT 3
MISCELLANEOUS INFORMATION
AS OF JUNE 30

Active Members

		1974	1976	1977
(1)	Number of Active			
	Members	5,341	6,209	7,024
(2)	Average Age	37.93	37.42	37.20
(3)	Average Service to Date	9.31	8.95	8.70
(4)	Average Annual Salary	\$16,270	\$21,267	\$22,887
	Retirees	and Benefic	<u>ciaries</u>	
(1)	Number of Retirees and Beneficiaries	544	793	891
(2)	Average Age	64.84	63.55	63.39
(3)	Average Monthly Benefit	\$676	\$780	\$861

APPENDIX 3 VALUATION ASSETS

EXHIBIT 4

DEVELOPMENT OF VALUATION ASSETS

AS OF

JUNE 30, 1977

		Book Value	Market Value	Ratio (M/B)
(1)	June 30, 1977	\$177,345,469	\$184,323,044	1.0393
(2)	June 30, 1976	137,623,382	141,205,993	1.0260
(3)	June 30, 1975	105,797,313	107,334,422	1.0145
(4)	Average Ratio			1.0266
(5)	Book Value at June 30, 1977			\$177,345,469
(6)	Valuation Assets June 30, 1977 (4)x(5)	at		<u>\$182,062,858</u>

APPENDIX 4 ACTUARIAL DETERMINATIONS

EXHIBIT 5

DEVELOPMENT OF PENSION COST FOR 1978-79

(1)	Total Present Value of Fully Projected Benefits	\$501,718,651
(2)	Valuation Assets	182,062,858
(3)	Present Value of Future Member Contributions	76,427,631
(4)	Present Value of Future Supplemental Contributions	3,541,830
(5)	Present Value of Future Arrearage Payments	9,570,246 <
(6)	Present Value of Future Contributions From the Employer and the State (1)-(2)-(3)-(4)-(5)	230,116,086
(7)	Normal Cost (6) x .08554	19,684,130
(8)	Member Salaries used in this Valuation	160,755,010
(9)	Normal Cost Contribution Rate (7)÷(8)	12.24%
(10)	Contribution for Retiree Medical Insurance	.62%
(11)	Total Employer-State Contribution Rate	12.86%

EXHIBIT 6

BREAKDOWN OF PRESENT VALUE

OF BENEFITS

	Present Value of Accrued Benefits	Present Value of Fully Projected Benefits
Retirement Benefits	\$152,912,660	\$282,634,900
Disability Benefits	8,663,943	10,156,536
Death Benefits	5,832,935	9,079,346
Termination Benefits	35,660,028	87,534,379
Contributions plus Inter for Inactive Members	est 4,494,112	4,494,112
Total Present Value of Benefits for all Non- Retired Members	\$207,563,678	\$393,899,273
Present Value of Benefits for Retirees	107,819,378	107,819,378
Total Present Value of Benefits	\$315,383,056	<u>\$501,718,651</u>

APPENDIX 5

SUMMARY OF THE PROVISIONS

OF THE

ALASKA TEACHERS' RETIREMENT SYSTEM

AS OF

JULY 1, 1976

SUMMARY OF THE SYSTEM

(1) <u>Plan</u>

The Teachers' Retirement System of Alaska is a joint contributory retirement system to provide benefits for teachers of the State.

(2) Effective Date

June 30, 1955.

(3) Administration of Plan

The Commissioner of Administration is the administrator of the System; the Alaska Teachers' Retirement Fund Advisory Board makes recommendations to the Commissioner of Administration; and the Commissioner of Revenue invests the funds.

(4) Membership

Membership in the Alaska Teachers' Retirement System is compulsory for all eligible teachers, school nurses, principals, supervisors and superintendents contracted on a full-time basis in public schools in Alaska.

(5) Credited Service

A year of service is defined to be the same as a school term which is currently a minimum of 172 days, and fractional service credit is on a daily rate basis. Credit is granted for all Alaskan public school service.

Up to 10 years of public school teaching service outside Alaska or in an institution of higher learning not under control of the Board of Regents of the University of Alaska is credited for retirement purposes. In addition, teaching service in BIA schools may be used to increase total outside and BIA service credit to 15 years. No fractional credit is granted for outside service.

A maximum of 5 years of Military Service after January 1, 1940 will be included as "outside service".

(6) Contributions by Teachers

Effective July 1, 1970, each teacher shall contribute 7% of base salary accrued from July 1 to the following June 30.

(7) Voluntary Supplemental Contributions

If a teacher wishes to make his spouse or minor children eligible for a spouse's pension and/or survivor's pension allowance, he may elect to make supplemental contributions of an additional 1% of his base salary commencing not later than 90 days after entry in the System, marriage or the birth or adoption of a child.

(8) Retroactive Contributions - Arrearage Contributions

If a teacher was not subject to the provisions of the Retirement Act and, at a later date became eligible for membership due to legislative changes of the eligibility requirements, the teacher may elect to receive credit for his creditable service prior to membership by submitting to the Retirement Fund an amount equal to the contributions that would have

been made if the teacher had been a member of the System for any year's service after June 30, 1955, plus interest thereon. Retroactive contributions are not required for creditable membership service before June 30, 1955.

In addition, if a member wishes to receive credit under the System for service performed outside Alaska, an arrearage indebtedness is established.

(9) Employers' and State's Contributions

The employer and the State each contribute an amount equal to one-half of the amount required in addition to member contributions to finance the benefits of the System.

(10) Rate of Interest

The amount deposited in a member account will be credited with interest at the rate established for a school year at the end of such school year. Effective July 1, 1973, the interest rate was increased to 4 1/2%.

(11) Withdrawal of Contributions

If a member terminates teaching services in Alaska and does not intend to re-enter membership service at a future date, contributions may be withdrawn. A withdrawing teacher will receive total contributions plus the interest credited.

(12) Reinstatement of Contributions

If Teachers' Retirement Contributions are withdrawn and a member subsequently resumes teaching in Alaska, the member

will be indebted to the Teachers' Retirement Fund in the amount of the previous contributions to the System including any interest paid. The reinstatement indebtedness bears compound interest at the rate prescribed by regulation to the date of repayment or the date of retirement, whichever occurs first.

(13) Minimum Service Requirements

- (1) 8 years of membership service, or
- (2) 15 years of creditable service, the last five of which have been membership service; (after July 1, 1975 a new member needs 8 years of membership service); or
- (3) 25 years of creditable service, the last 5 of which are membership service; or
- (4) 20 years of membership service.

(14) Normal Retirement Eligibility

A teacher may retire and receive full benefits

- (1) Upon attaining age 55 and meeting the minimum service requirements; or
- (2) At any age after 25 years of creditable service, the last 5 of which are membership service; or
- (3) At any age after 20 years of membership service.

A retired teacher who has been receiving a disability retirement salary shall be eligible for a service retirement salary upon or after attaining age 55.

(15) Computation of Average Base Salary

A teacher's average base salary is determined by averaging the teacher's highest base salary which he received for any three out of the last 10 years of membership service.

(16) Normal Retirement Benefit

The normal retirement benefit is 2% of the teacher's Average Base Salary multiplied by the total number of years of creditable service.

(17) Early Retirement Benefit

A teacher is eligible for early retirement benefits if he has completed the minimum service requirements and has attained the age of 50. If the teacher does not apply for retirement benefits to start prior to his 55th birthday, he is eligible to receive the normal retirement benefit. If the retiring teacher elects to have payments of the benefit begin prior to his 55th birthday, the annual annuity is equal to his normal retirement benefit based on his salary history and creditable service to his retirement date, reduced by one-half of 1% per month for each month by which his age at retirement is less than 55 years.

(18) Deferred Vested Benefit

A teacher is eligible for a deferred vested benefit if he

(1) terminates his membership after completing eight years

of membership service, and (2) he does not withdraw his

retirement contributions. Payment of this benefit is deferred

until the first of the month following the teacher's 55th birthday or the first of the month in which the application for benefit is filed, whichever is later.

(19) Arrearage Payment - Retired Teachers

If on the date of making application for retirement, a teacher has not paid the full amount of his indebtedness including interest to the Retirement Fund, one of the following options may be chosen:

Option 1: The retirement salary can be withheld until the amount withheld is equal to the outstanding indebtedness.

Option 2: A reduced annuity, completed by deducting 10% of the outstanding indebtedness at the time of retirement from the annual retirement salary, can be paid to the teacher.

(20) Re-employment of a Retired Teacher

If a retired teacher is re-employed as a full-time teacher, his retirement salary will be suspended during the period of employment.

Retirement Contributions are made at the option of such teacher and an additional retirement benefit may be accrued.

(21) Disability Retirement Benefits

A disability retirement annuity may be paid if a teacher has become permanently disabled and has at least five years of membership service.

The benefit will be equal to 50% of the disabled teacher's base salary immediately prior to becoming disabled. This benefit will be increased by 10% of the teacher's base salary for each minor child up to a maximum of four minor children until the first day of the month in which the child ceases to be a minor.

When the disabled teacher attains age 55, the disability salary will automatically terminate. A normal retirement salary will be computed as if the teacher had been in membership service during the period of disability, and a service retirement will be granted. The base salary used will be the same used in computing the disability benefit.

(22) Cost-of-Living Allowance

A retired teacher whose permanent residence is in Alaska subsequent to retirement and/or whose absence is of a temporary nature, not to exceed six months, for travel or vacation purposes is entitled to receive a cost-of-living allowance, not to exceed 10% of his annual retirement salary in addition to his retirement benefit.

(23) Post-Retirement Pension Adjustment

This adjustment is promulgated by regulation and payable to a retired teacher when the administrator determines that the cost of living has increased and the financial condition of the fund permits payment of the adjustment. The amount of increase in any year shall not exceed 4%.

(24) Exemption from Taxation and Process

Teachers' retirement salaries are exempt from state and municipal taxes, are not subject to execution, attachment, garnishment or other process, but must be reported to the Internal Revenue Service for federal tax purposes.

(25) Lump Sum Death Benefit

Upon death of a member who has made no supplemental contributions or who made supplemental contributions for less than one year, a lump-sum benefit shall be paid to the designated beneficiary.

Upon death of a teacher who was in membership service at the time of his death, the lump-sum benefit is the teacher's accumulated contributions with interest thereon to his date of death. An additional death benefit equal to \$1,000 plus \$100 for each year of completed service plus \$500 if the teacher is survived by one or more minor children is also payable. In no case shall the additional benefit exceed \$3,000.

If the teacher had received a retirement benefit prior to his death, payment shall be his accumulated contributions, plus interest, minus all benefits paid.

If a member failed to designate a beneficiary, or if no designated beneficiary survives the member, payment shall be made:

- to his surviving spouse or if there is no surviving spouse,
- (2) to his surviving children in equal parts, or if there are none surviving,
- (3) to his surviving parents in equal parts, or, if there are none surviving,
- (4) to his estate.

(26) Survivor's Allowance

If a teacher dies while in service or while receiving retirement salary, is survived by one or more minor children and has made supplemental contributions for at least one year before his death, his surviving spouse is entitled to the survivor's allowance. The amount of the benefit is 35% of the teacher's base salary immediately prior to his death or becoming disabled for his spouse and 10% for each minor child up to a maximum of four.

(27) Spouse's Pension

If any teacher has made supplemental contributions for at least one year and dies while in service or while receiving a retirement salary or is entitled to a deferred vested benefit, the surviving spouse is entitled to receive the spouse's pension. The amount of the benefit is 50% of the service retirement salary that the deceased teacher was receiving or would have received. The spouse's pension commences on the first day of the month coinciding with

or next following the spouse's 55th birthday or date of total and permanent disability. The final payment is made the first day of the month in which the spouse dies or remarries.