

STATE OF ALASKA
PUBLIC EMPLOYEES' RETIREMENT SYSTEM

Actuarial Valuation
as of
December 31, 1976

**WILLIAM M.
MERCER**

WILLIAM M.
MERCER
INCORPORATED

Benefit Services / Consulting Actuaries

October 18, 1977

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

Dear Commissioner Allen:

At your request, we have completed an actuarial valuation of the Alaska Public Employees' Retirement System as of December 31, 1976, in order to examine the financial status of the System and to determine the Employer contribution rates for the 1978-79 fiscal year.

The results of our valuation, included in this report, are based upon employee data and financial information supplied by your Department and the actuarial assumptions and methods chosen by the Actuary.

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.

Respectfully submitted,



Robert F. Richardson, MAAA
Assistant Vice President

RFR:jn

Attachments

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SECTION I

SUMMARY OF THE VALUATION

This report presents the results of the actuarial valuation of the Alaska Public Employees' Retirement System as of December 31, 1976. 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 increased slightly, primarily due to greater than anticipated salary increases. The following table summarizes these rates.

| | --- Valuation Date --- | |
|-------------------------------------|------------------------|-----------------|
| | <u>12-31-75</u> | <u>12-31-76</u> |
| (1) Consolidated Rate | 9.43% | 9.90% |
| (2) Average Past Service Rate | <u>1.97%</u> | <u>1.89%</u> |
| (3) Average Total Contribution Rate | 11.40% | 11.79% |

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 more than offset the effect of rapid growth in salaries during the year, thus leading to an increase in the accrued benefit funding ratio.

William M. Mercer, Incorporated

| | ---- Valuation Date ---- | |
|--|--------------------------|-----------------|
| | <u>12-31-75</u> | <u>12-31-76</u> |
| (1) Valuation Assets | \$119,860,568 | \$159,121,540 |
| (2) Present Value of Accrued Benefits | 196,992,761 | 246,981,544 |
| (3) Accrued Benefit Funding Ratio | 60.8% | 64.4% |

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 December 31, 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 Public Employees' 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 7.09%. Appreciation brought in another 6.65%, resulting in a total time weighted return rate

for the year of 13.75%. 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) Salary Scale

The present salary scale, which assumed annual increases in salaries of 5% for all ages, has understated salary trends of the last several years. In an attempt to more accurately 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) Turnover

For the 1972 valuation report, a new turnover table was adopted, based upon several years of actual experience under the System. It is our recommendation that another experience study be undertaken in order to update those turnover rates and thereby reflect the most recent 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. Actual experience has shown that 94% of the police and fire disabilities are "occupational" and 28% for other employees. We recommend utilizing these percentages rather than the 80% and 20% respectively which are now being used.

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 that the retirement age assumption also be reviewed in the experience study.

(7) Contribution Refund

Our present assumption is that only 10% of those terminating 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 have been assuming that 60% 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 now receive C.O.L.A. is 59.4%. Therefore, we recommend no change in this assumption at this time.

B. Actuarial Methods

(1) Contribution Rates

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.

| <u>Valuation Date</u> | <u>Average Contribution Rate</u> | | | |
|-----------------------|----------------------------------|------|-------|-------|
| 12-31-73 | 4.57 | 6.46 | | |
| 12-31-74 | | 8.12 | 10.39 | |
| 12-31-75 | | | NA | 11.40 |
| 12-31-76 | | | | 11.79 |

As the table indicates, contribution rates increased in the two years that comparisons are possible. This is an indication that actuarial assumptions may be too liberal and that changes may be in order. The inclusion of new employers and PRPA adjustments are other significant factors which tend to increase rates.

(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 December 31, 1973 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 82% to 65%. Please note that the funding ratios shown here are based upon all accrued benefits and all assets of the System; liabilities and assets for retirees have been included.

| <u>Valuation Date</u> | <u>Funding Ratios</u> | | | |
|---------------------------|-----------------------|-----|-----|-----|
| 12-31-73 | 104% | 99% | | |
| 12-31-74 | | 82% | 65% | |
| 12-31-75 | | | NA | 61% |
| 12-31-76 | | | | 64% |

(3) Conclusions

The above two tables indicate that the effects of legislation on both contribution rates and funding ratios has been significant. It is reassuring to see the accrued benefit funding ratio increase from 61% to 64% during 1976. As indicated in prior actuarial valuation reports, progress in the funding ratio is an important indicator of the "actuarial soundness" of the System.

The actuarial method which has been used for several years is one of the more widely used actuarial cost methods and is perhaps one of the most understandable. This method is perhaps the one most suited to handle on an equitable basis the inclusion into this System and termination of various employers. Consequently, we would recommend no change in the present actuarial cost method.

As mentioned in previous actuarial valuation reports, we would recommend that market values of the total fund be recognized rather than solely using the book value of the fund. In order to smooth out fluctuations in market values, we would recommend that the assets used for valuation purposes be based upon the three-year average relationship between market and book values.

C. Member Data

As can be seen in Exhibit 3, the average age of active members has decreased gradually over the last three years while average service has increased. Of greater significance is the increase in the number of active members as well as a large increase in average annual salary. During 1976, the average annual salary of all active members increased by 10% to \$18,232. Perhaps of greater significance was the 13% increase in average salaries of all participants with one or more years of service from \$17,971 in 1975 to \$20,308 in 1976. This large increase in pay was the most important factor leading to the increase in the total average contribution rate this year. The data received this year was of excellent quality with missing data for a relatively small number of members.

D. Retired Life Reserves

As indicated in prior actuarial reports, the deficit in the retired life reserves continues to grow. At the end of 1976, the deficit between the present value of benefits for retirees and the assets held in the retired life reserves equaled \$32,450,881. Earlier this year, we recommended procedures to provide for the transfer of assets from the employer funds to the retired life reserves in order to eliminate this deficit. It is hoped that this procedure will be implemented before the next actuarial valuation report.

E. Alternate Amortization Periods

Should you decide to amortize the unfunded accrued benefit liability over 30 years rather than the 35-year period used in this report, the past service contributions rates for each employer would increase by 6.516%. This would increase the average total contribution rate for all employers from 11.79% to 11.88%. The total contribution rate for the State would increase from 11.97% to 12.10%.

SECTION 3

SUMMARY AND CONCLUSIONS

The results of this valuation indicate that the average Total Contribution Rate has increased to 11.79% for the 1978-79 fiscal year.

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. We have recommended no change in the actuarial cost method. However, we have recommended that the market value of the trust be recognized in order to determine costs under the System.

APPENDIX 1

ACTUARIAL METHOD AND ASSUMPTIONS

ACTUARIAL BASIS

Valuation of Liabilities

- A. Actuarial Method - Attained Age Normal, also known as Aggregate Method with Supplemental Liability. The unfunded accrued benefit liability is amortized over 35 years.
- B. Actuarial Assumptions -
- | | |
|--------------------------|---|
| (1) Interest | 5% per annum, compounded annually, net of investment expenses. |
| (2) Salary Scale | 5% per annum, compounded annually. |
| (3) Mortality | 1951 Group Annuity Mortality Table with Projection "C" to 1965. |
| (4) Turnover | Based upon actual total turnover experience. (See Table 1.) |
| (5) Disability | Incidence rates in accordance with Table 2. Post-disability mortality in accordance with the 1944 Railroad Retirement experience rates. 80% of the disabilities are assumed to be occupational for police and fire; 20% for others. |
| (6) Retirement Age | Later of age 55 and 20 years for police and fire; age 55 and 30 years of service for others. |
| (7) Contribution Refunds | 90% of terminating employees will take their contributions; 10% will leave their contributions and receive their deferred vested benefit. |
| (8) Expenses | No loading for expenses. |

Valuation of Assets - Book Value

TABLE 1
STATE OF ALASKA
VALUATION TURNOVER RATES

| <u>Age</u> | <u>Male</u> | <u>Female</u> |
|------------|-------------|---------------|
| 20 | .3274 | .3753 |
| 21 | .2782 | .3490 |
| 22 | .2408 | .3290 |
| 23 | .2334 | .3254 |
| 24 | .2151 | .3162 |
| 25 | .1917 | .3041 |
| 26 | .1690 | .2916 |
| 27 | .1528 | .2814 |
| 28 | .1510 | .2792 |
| 29 | .1465 | .2734 |
| 30 | .1408 | .2652 |
| 31 | .1351 | .2560 |
| 32 | .1309 | .2471 |
| 33 | .1303 | .2435 |
| 34 | .1289 | .2342 |
| 35 | .1269 | .2218 |
| 36 | .1248 | .2087 |
| 37 | .1229 | .1973 |
| 38 | .1223 | .1937 |
| 39 | .1207 | .1845 |
| 40 | .1185 | .1725 |
| 41 | .1161 | .1603 |
| 42 | .1140 | .1505 |
| 43 | .1132 | .1480 |
| 44 | .1112 | .1416 |
| 45 | .1081 | .1335 |
| 46 | .1060 | .1257 |
| 47 | .1041 | .1200 |
| 48 | .1038 | .1192 |
| 49 | .1025 | .1173 |
| 50 | .1021 | .1150 |
| 51 | .1012 | .1128 |
| 52 | .1006 | .1115 |
| 53 | .1004 | .1112 |
| 54 | .0996 | .1108 |
| 55 | .0997 | .1107 |
| 56 | .0999 | .1114 |
| 57 | .1009 | .1135 |
| 58 | .1011 | .1156 |
| 59 | .1022 | .1208 |
| 60 | .1047 | .1277 |

TABLE 2
PUBLIC EMPLOYEES' RETIREMENT SYSTEM
OF ALASKA

Disability Rates

All Employees

Annual Rates Per 1,000 Employees

| <u>Age</u> | <u>Rate</u> | <u>Age</u> | <u>Rate</u> |
|------------|-------------|------------|-------------|
| 20 | .70 | 45 | 1.62 |
| 21 | .71 | 46 | 1.76 |
| 22 | .72 | 47 | 1.91 |
| 23 | .73 | 48 | 2.07 |
| 24 | .74 | 49 | 2.23 |
| 25 | .75 | 50 | 2.40 |
| 26 | .76 | 51 | 2.60 |
| 27 | .78 | 52 | 2.86 |
| 28 | .80 | 53 | 3.18 |
| 29 | .82 | 54 | 3.55 |
| 30 | .84 | 55 | 4.00 |
| 31 | .86 | 56 | 4.59 |
| 32 | .88 | 57 | 5.34 |
| 33 | .90 | 58 | 6.10 |
| 34 | .93 | 59 | 7.20 |
| 35 | .96 | 60 | 8.43 |
| 36 | .99 | 61 | 9.75 |
| 37 | 1.03 | 62 | 11.30 |
| 38 | 1.07 | 63 | 13.05 |
| 39 | 1.11 | 64 | 14.90 |
| 40 | 1.15 | | |
| 41 | 1.20 | | |
| 42 | 1.27 | | |
| 43 | 1.36 | | |
| 44 | 1.48 | | |

APPENDIX 2
PARTICIPANT DATA

William M. Mercer, Incorporated

VALUATION DATE 12/31/75

STATE OF ALASKA - PUBLIC EMPLOYEES RETIREMENT SYSTEM

| AGE GROUP | ANNUAL EARNINGS BY AGE----- | | ANNUAL EARNINGS BY SERVICE----- | |
|-----------|-----------------------------|-----------------------|---------------------------------|------------------|
| | NUMBER OF PEOPLE | TOTAL ANNUAL EARNINGS | SERVICE GROUP | NUMBER OF PEOPLE |
| 0-19 | 276 | 2545367. | 0 | 3199 |
| 20-24 | 1818 | 21736163. | 1 | 2726 |
| 25-29 | 2942 | 47264023. | 2 | 1945 |
| 30-34 | 2398 | 46924917. | 3 | 1249 |
| 35-39 | 1858 | 36866118. | 4 | 992 |
| 40-44 | 1549 | 31450422. | 0-4 | 10111 |
| 45-49 | 1397 | 29296062. | 5-9 | 2806 |
| 50-54 | 1170 | 24419116. | 10-14 | 1205 |
| 55-59 | 822 | 17406049. | 15-19 | 514 |
| 60-64 | 444 | 9421059. | 20-24 | 118 |
| 65-69 | 108 | 2219336. | 25-29 | 39 |
| 70-74 | 17 | 268227. | 30-34 | 11 |
| 75-79 | 3 | 57287. | 35-39 | 0 |
| 80+ | 2 | 32343. | 40+ | 0 |
| TOTAL | 14804 | 269906470. | TOTAL | 14804 |

| ANNUAL EARNINGS BY SERVICE----- | | ANNUAL EARNINGS BY SERVICE----- | |
|---------------------------------|-------------------------|---------------------------------|-------------------------|
| TOTAL ANNUAL EARNINGS | AVERAGE ANNUAL EARNINGS | TOTAL ANNUAL EARNINGS | AVERAGE ANNUAL EARNINGS |
| 34227801. | 9222. | 34227801. | 10700. |
| 42448802. | 11956. | 42448802. | 15572. |
| 34777337. | 16065. | 34777337. | 17880. |
| 23624543. | 19568. | 23624543. | 18915. |
| 20657527. | 19842. | 20657527. | 20824. |
| 155734310. | 20304. | 155734310. | 15402. |
| 62930417. | 20971. | 62930417. | 22427. |
| 31355618. | 20871. | 31355618. | 26021. |
| 15060312. | 21175. | 15060312. | 29300. |
| 3296735. | 21219. | 3296735. | 27938. |
| 1158604. | 20549. | 1158604. | 29708. |
| 368685. | 15778. | 368685. | 33517. |
| 0. | 19096. | 0. | 0. |
| 0. | 16171. | 0. | 0. |
| 269904680. | 18232. | 269904680. | 18232. |

SERVICE GROUPS BY AGE GROUPS

| AGE GROUP | S E R V I C E G R O U P S | | | | | | | | | | TOTAL |
|-----------|---------------------------|------|-------|-------|-------|-------|-------|-------|-----|-------|-------|
| | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40+ | TOTAL | |
| 0-19 | 276 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 276 | |
| 20-24 | 1790 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1818 | |
| 25-29 | 2622 | 305 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 2942 | |
| 30-34 | 1726 | 564 | 108 | 0 | 0 | 0 | 0 | 0 | 0 | 2398 | |
| 35-39 | 1165 | 458 | 199 | 35 | 1 | 0 | 0 | 0 | 0 | 1858 | |
| 40-44 | 876 | 350 | 203 | 109 | 11. | 0 | 0 | 0 | 0 | 1549 | |
| 45-49 | 659 | 359 | 220 | 118 | 38 | 3 | 0 | 0 | 0 | 1397 | |
| 50-54 | 485 | 334 | 208 | 101 | 24 | 13 | 5 | 0 | 0 | 1170 | |
| 55-59 | 315 | 242 | 144 | 79 | 27 | 13 | 2 | 0 | 0 | 822 | |
| 60-64 | 154 | 125 | 81 | 57 | 14 | 10 | 3 | 0 | 0 | 444 | |
| 65-69 | 34 | 33 | 24 | 14 | 3 | 0 | 0 | 0 | 0 | 109 | |
| 70-74 | 7 | 5 | 3 | 1 | 0 | 1 | 0 | 0 | 0 | 17 | |
| 75-79 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | |
| 80+ | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | |
| TOTAL | 10111 | 2806 | 1205 | 514 | 118 | 39 | 11 | 0 | 0 | 14804 | |

William M. Mercer, Incorporated

STATE OF ALASKA PUBLIC EMPLOYEES RETIREMENT SYSTEM - RETIRED LIVES VALUATION DATE 12/31/76

| AGE GROUP | MONTHLY BENEFIT BY AGE----- | | MONTHLY NUMBER OF PEOPLE | SERVICE GROUP | MONTHLY NUMBER OF PEOPLE | BENEFIT BY SERVICE----- | |
|-----------|-----------------------------|-------------------------|--------------------------|---------------|--------------------------|-------------------------|-------------------------|
| | TOTAL MONTHLY BENEFIT | AVERAGE MONTHLY BENEFIT | | | | TOTAL MONTHLY BENEFIT | AVERAGE MONTHLY BENEFIT |
| 0-19 | 0. | 0. | 0 | 0 | 398 | 200246. | 503. |
| 20-24 | 671. | 671. | 1 | 1 | 283 | 124477. | 440. |
| 25-29 | 1527. | 509. | 3 | 2 | 158 | 67769. | 429. |
| 30-34 | 3878. | 776. | 5 | 3 | 182 | 60162. | 331. |
| 35-39 | 7574. | 541. | 14 | 4 | 122 | 39695. | 325. |
| 40-44 | 6722. | 517. | 13 | 0-4 | 1143 | 492349. | 431. |
| 45-49 | 8723. | 969. | 9 | 5-9 | 177 | 58275. | 329. |
| 50-54 | 47563. | 495. | 96 | 10-14 | 18 | 5566. | 309. |
| 55-59 | 141450. | 493. | 287 | 15-19 | 1 | 255. | 255. |
| 60-64 | 140968. | 445. | 317 | 20-24 | 0 | 0. | 0. |
| 65-69 | 122669. | 350. | 350 | 25-29 | 0 | 0. | 0. |
| 70-74 | 52211. | 316. | 165 | 30-34 | 0 | 0. | 0. |
| 75-79 | 17577. | 298. | 59 | 35-39 | 0 | 0. | 0. |
| 80+ | 4913. | 246. | 20 | 40+ | 0 | 0. | 0. |
| TOTAL | 556446. | 416. | 1339 | TOTAL | 1339 | 556445. | 416. |

SERVICE GROUPS BY AGE GROUPS

| AGE GROUP | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40+ | TOTAL |
|-----------|-----|-----|-------|-------|-------|-------|-------|-------|-----|-------|
| 0-19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20-24 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 25-29 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 30-34 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 35-39 | 11 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| 40-44 | 10 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 45-49 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 50-54 | 92 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 96 |
| 55-59 | 284 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 287 |
| 60-64 | 308 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 317 |
| 65-69 | 309 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 350 |
| 70-74 | 81 | 82 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 165 |
| 75-79 | 20 | 28 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 59 |
| 80+ | 11 | 4 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 20 |
| TOTAL | 0 | 177 | 18 | 1 | 0 | 0 | 0 | 0 | 0 | 1339 |

EXHIBIT 3
MISCELLANEOUS INFORMATION
AS OF DECEMBER 31

| | <u>Active Members</u> | | |
|--------------------------------------|-----------------------|-------------|-------------|
| | <u>1974</u> | <u>1975</u> | <u>1976</u> |
| (1) Number | 14,692 | 13,789 | 14,804 |
| (2) Number with Complete Information | 11,692 | 13,427 | 14,545 |
| (3) Average Age | 37.93 | 37.70 | 37.29 |
| (4) Average Service | 4.00 | 4.34 | 4.48 |
| (5) Average Annual Salary | \$13,235 | \$16,535 | \$18,232 |

| | <u>Retirees and Beneficiaries</u> | | |
|-----------------------------|-----------------------------------|-------|-------|
| (1) Number | 714 | 941 | 1,339 |
| (2) Average Age | 65.02 | 64.04 | 63.38 |
| (3) Average Monthly Benefit | \$305 | \$346 | \$416 |

APPENDIX 3
ACTUARIAL DETERMINATIONS

EXHIBIT 4
DEVELOPMENT OF CONSOLIDATED
EMPLOYER CONTRIBUTION RATE
FOR 1978-79

| | |
|--|----------------|
| (1) Present Value of Fully Projected Benefits | \$ 447,343,072 |
| (2) Present Value of Accrued Benefits | 246,981,544 |
| (3) Present Value of Future Member Contributions | 62,887,010 |
| (4) Present Value of Future Consolidated Employer Contributions (1)-(2)-(3) | 137,474,518 |
| (5) Present Value of Future Salaries | 1,447,508,580 |
| (6) Consolidated Employer Contribution Rate for Pension Benefits (4)÷(5) | 9.50% |
| (7) Rate for Retiree Medical Insurance | <u>.40%</u> |
| (8) Total Consolidated Employer Contribution Rate | <u>9.90%</u> |

EXHIBIT 5

William M. Mercer, Incorporated DEVELOPMENT OF PAST SERVICE RATES
FOR 1978-79

| | (a) Liability for Benefits Earned to 12-31-76 | (b) Adjusted Assets | (c) Unfunded Liability or (Surplus) ((a)-(b)) | (d) Payment to Amortize Liability - 35 Years | (e) Salaries | (f) Past Service Rate (d)/(e) |
|--------------------------------|--|---------------------------|---|--|-----------------|-------------------------------------|
| State of Alaska | \$117,198,420 | \$59,884,603 | \$57,313,317 | \$3,333,574 | \$161,006,850 | 2.07% |
| City of Skagway | 26,962 | 42,161 | (15,199) | (884) | 175,438 | (.50%) |
| City and Borough of Sitka | 1,291,176 | 528,615 | 762,561 | 44,353 | 1,820,398 | 2.44% |
| City of Fairbanks | 5,950,518 | 2,130,997 | 3,819,521 | 222,157 | 9,079,790 | 2.45% |
| City of Haines | 42,192 | 54,510 | (12,318) | (716) | 168,862 | (.42%) |
| University of Alaska | 8,191,296 | 5,637,556 | 2,553,740 | 148,535 | 18,062,440 | .82% |
| City of Valdez | 493,395 | 205,216 | 288,179 | 16,762 | 747,302 | 2.24% |
| City of Kodiak | 754,740 | 470,647 | 284,093 | 16,524 | 1,105,522 | 1.49% |
| Alaska Municipal League | 144,277 | 46,648 | 97,629 | 5,578 | 66,348 | 8.56% |
| City of Kenai | 318,208 | 438,967 | (120,759) | (7,024) | 847,160 | (.83%) |
| Municipality of Anchorage | 29,201,161 | 10,723,769 | 18,477,392 | 1,074,709 | 50,877,452 | 2.11% |
| North Star Borough | 2,485,542 | 1,776,003 | 709,539 | 41,269 | 6,315,348 | .65% |
| Ketchikan Gateway Borough | 149,434 | 158,447 | (9,013) | (524) | 508,698 | (.10%) |
| Matanuska-Susitna Borough | 1,039,496 | 484,047 | 555,449 | 32,307 | 1,694,162 | 1.91% |
| City of Soldotna | 13,644 | 39,938 | (26,294) | (1,529) | 103,076 | (1.48%) |
| City and Borough of Juneau | 3,122,748 | 2,218,327 | 904,421 | 52,604 | 5,159,524 | 1.02% |
| City of Wrangell | 222,064 | 126,546 | 95,518 | 5,556 | 472,352 | 1.18% |
| City of Bethel | 13,154 | 16,736 | (3,582) | (208) | 33,862 | (.62%) |
| Valdez City Schools | 50,580 | 57,791 | (7,211) | (419) | 208,044 | (.20%) |
| Hoonah City Schools | 131,160 | 47,590 | 83,570 | 4,861 | 178,362 | 2.73% |
| Nome Municipal Utilities | 353,352 | 113,449 | 239,903 | 13,954 | 1,043,606 | 1.34% |
| City of Kotzebue | 15,026 | 47,225 | (32,199) | (1,873) | 121,298 | (1.54%) |
| Galena City Schools | 10,824 | 15,077 | (4,253) | (247) | 51,652 | (.46%) |
| King Cove City School District | 17,108 | 10,392 | 6,716 | 391 | 42,248 | .92% |
| City of Petersburg | 222,124 | 65,474 | 156,650 | 9,111 | 718,502 | 1.27% |
| Bristol Bay Borough | 202,872 | 19,246 | 183,626 | 10,680 | 94,178 | 11.34% |
| North Slope Borough | 491,096 | 169,289 | 321,807 | 18,717 | 781,804 | 2.39% |
| Wrangell City Schools | 108,404 | 24,473 | 83,931 | 4,382 | 70,322 | 6.94% |
| Unorganized Borough Schools | 142,442 | 564,686 | (522,244) | (30,376) | 274,752 | (11.06%) |
| Sitka Community Hospital | 102,160 | 22,214 | 79,946 | 4,650 | 387,904 | 1.20% |
| City of Cordova | 171,372 | 88,679 | 82,693 | 4,310 | 536,666 | .90% |
| Nome City Schools | 161,418 | (77,443) | 238,861 | 13,893 | 331,868 | 4.19% |
| City of King Cove | 2,314 | 4,972 | (2,158) | (125) | 12,108 | (1.04%) |
| Selawik City School District | 63,240 | 42,520 | 20,620 | 1,139 | 101,056 | 1.19% |
| Juneau Borough School District | 875,103 | 463,397 | 411,706 | 23,946 | 1,226,902 | 1.95% |
| Juneau Hospital | 64,196 | 33,594 | 30,502 | 1,780 | 245,642 | .72% |

William M. Mercer, Incorporated

EXHIBIT 5

DEVELOPMENT OF PAST SERVICE RATES
FOR 1978-79

| | (a) | (b) | (c) | (d) | (e) | (f) |
|---|---|--------------------|--|---|---------------|------------------------------|
| | Liability for Benefits Earned to 12-31-76 | Adjusted Assets | Unfunded Liability or (Surplus) (a)-(b) | Payment to Amortize Liability - 35 Years | Salaries | Past Service Rate (d)/(e) |
| Upper Railbelt Region Schools | \$ 55,750 | \$ 21,466 | \$ 34,284 | \$ 1,994 | \$ 173,924 | 1.15% |
| Iditarod Area School District | 9,236 | 7,212 | 2,024 | 118 | 114,268 | .10% |
| Kuspuk School District | 10,604 | 14,451 | (3,847) | (224) | 159,116 | .14% |
| Chugach Regional School District | 2,354 | 1,498 | 856 | 50 | 78,058 | .06% |
| Lower Yukon School District | 26,006 | 20,636 | 5,370 | 312 | 281,956 | .11% |
| Kodiak Island School District | 134,318 | 25,299 | 109,019 | 6,341 | 361,208 | 1.76% |
| Cordova Community Hospital | 182,466 | 23,572 | 158,894 | 9,242 | 301,236 | 3.07% |
| City of Delta Junction | 3,520 | 10,006 | (6,486) | (377) | 45,278 | (.83%) |
| Alaska Housing Finance Corporation | 93,950 | 20,583 | 73,367 | 4,267 | 154,858 | 2.76% |
| Northwest Arctic School District | 232,080 | 104,202 | 127,878 | 7,438 | 1,240,360 | .60% |
| Southeast Islands School District | 6,392 | 7,148 | (756) | (44) | 191,290 | (.02%) |
| Pribilof Region School District | 12,140 | 6,607 | 5,533 | 322 | 59,984 | .54% |
| Lower Kuskokwim School District | 166,232 | 74,495 | 91,737 | 5,336 | 743,756 | .72% |
| Yukon Flats School District | 118,270 | 32,780 | 85,490 | 4,972 | 177,208 | 2.81% |
| Yukon-Koyukok School District | 4,038 | 19,134 | (15,096) | (878) | 46,028 | (1.91%) |
| Aleutian Region School District | 19,868 | 13,119 | 6,749 | 393 | 58,528 | .67% |
| Lake and Peninsula School District | 22,916 | 16,562 | 6,354 | 370 | 78,944 | .47% |
| Elected Officials | 59,528 | 10,869 | 48,659 | 2,830 | 56,596 | 5.00% |
| Bering Straits School District | 25,928 | 21,572 | 4,356 | 253 | 160,270 | .16% |
| Annette Island School District | 69,646 | 26,132 | 43,514 | 2,531 | 193,886 | 1.31% |
| S. W. Reg. Schools | 79,176 | 44,028 | 35,148 | 2,044 | 515,142 | .40% |
| S. E. Reg. Res. Center | 754 | 656 | 98 | 6 | 15,604 | .04% |
| South Central Regional Resource Center | 240 | 641 | (401) | (23) | 17,524 | (.13%) |
| Totals | \$175,179,130 | \$87,319,216 | \$87,860,004 | \$5,110,248 | \$269,896,520 | 1.89% |

VALUATION SUMMARY

William M. Mercer, Incorporated

PENSION COSTS

| | Consolidated Employer Contribution Rate | Past Service Rate | Total Employer Rate |
|--------------------------------|--|-------------------------|---------------------------|
| State of Alaska | 9.90% | 2.07% | 11.97% |
| City of Skagway | 9.90% | (.50%) | 9.40% |
| City and Borough of Sitka | 9.90% | 2.44% | 12.34% |
| City of Fairbanks | 9.90% | 2.45% | 12.35% |
| City of Haines | 9.90% | (.42%) | 9.48% |
| University of Alaska | 9.90% | .82% | 10.72% |
| City of Valdez | 9.90% | 2.24% | 12.14% |
| City of Kodiak | 9.90% | 1.49% | 11.39% |
| Alaska Municipal League | 9.90% | 8.56% | 18.46% |
| City of Kenai | 9.90% | (.83%) | 9.07% |
| Municipality of Anchorage | 9.90% | 2.11% | 12.01% |
| North Star Borough | 9.90% | .65% | 10.55% |
| Ketchikan Gateway Borough | 9.90% | (.10%) | 9.80% |
| Matanuska-Susitna Borough | 9.90% | 1.91% | 11.81% |
| City of Soldotna | 9.90% | (1.48%) | 8.42% |
| City and Borough of Juneau | 9.90% | 1.02% | 10.92% |
| City of Wrangell | 9.90% | 1.18% | 11.08% |
| City of Bethel | 9.90% | (.62%) | 9.28% |
| Valdez City Schools | 9.90% | (.20%) | 9.70% |
| Hoonah City Schools | 9.90% | 2.73% | 12.63% |
| Nome Municipal Utilities | 9.90% | 1.34% | 11.24% |
| City of Kotzebue | 9.90% | (1.54%) | 8.36% |
| Galena City Schools | 9.90% | (.48%) | 9.42% |
| King Cove City School District | 9.90% | .92% | 10.82% |
| City of Petersburg | 9.90% | 1.27% | 11.17% |
| Bristol Bay Borough | 9.90% | 11.34% | 21.24% |
| North Slope Borough | 9.90% | 2.39% | 12.29% |
| Wrangell City Schools | 9.90% | 6.94% | 16.84% |
| Unorganized Borough Schools | 9.90% | (11.06%) | 0.00% |
| Sitka Community Hospital | 9.90% | 1.20% | 11.10% |
| City of Cordova | 9.90% | .90% | 10.80% |
| Nome City Schools | 9.90% | 4.19% | 14.09% |
| City of King Cove | 9.90% | (1.04%) | 8.86% |
| Selawik City School District | 9.90% | 1.19% | 11.09% |
| Juneau Borough School District | 9.90% | 1.95% | 11.85% |
| Juneau Hospital | 9.90% | .72% | 10.62% |

William M. Mercer, Incorporated

VALUATION SUMMARY

PENSION COSTS

| | Consolidated Employer Contribution Rate | Past Service Rate | Total Employer Rate |
|---|--|-------------------------|---------------------------|
| Upper Railbelt Region Schools | 9.90% | 1.15% | 11.05% |
| Iditarod Area School District | 9.90% | .10% | 10.00% |
| Kuspuk School District | 9.90% | .14% | 10.04% |
| Chugach Regional School District | 9.90% | .06% | 9.96% |
| Lower Yukon School District | 9.90% | .11% | 10.01% |
| Kodiak Island School District | 9.90% | 1.76% | 11.66% |
| Cordova Community Hospital | 9.90% | 3.07% | 12.97% |
| City of Delta Junction | 9.90% | (.83%) | 9.07% |
| Alaska Housing Finance Corporation | 9.90% | 2.76% | 12.66% |
| Northwest Arctic School District | 9.90% | .60% | 10.50% |
| Southeast Islands School District | 9.90% | (.02%) | 9.88% |
| Pribilof Region School District | 9.90% | .54% | 10.44% |
| Lower Kuskokwim School District | 9.90% | .72% | 10.62% |
| Yukon Flats School District | 9.90% | 2.81% | 12.71% |
| Yukon-Koyukok School District | 9.90% | (1.91%) | 7.99% |
| Aleutian Region School District | 9.90% | .67% | 10.57% |
| Lake and Peninsula School District | 9.90% | .47% | 10.37% |
| Elected Officials | 9.90% | 5.00% | 14.90% |
| Bering Straits School District | 9.90% | .16% | 10.06% |
| Annette Island School District | 9.90% | 1.31% | 11.21% |
| S. W. Reg. Schools | 9.90% | .40% | 10.30% |
| S. E. Reg. Res. Center | 9.90% | .04% | 9.94% |
| South Central Regional Resource Center | <u>9.90%</u> | <u>(.13%)</u> | <u>9.77%</u> |
| | <u>9.90%</u> | <u>1.89%</u> | <u>11.79%</u> |

EXHIBIT 7
BREAKDOWN OF PRESENT VALUE
OF BENEFITS

| | <u>Present Value of Accrued Benefit</u> | <u>Present Value of Fully Projected Benefit</u> |
|---|---|---|
| Retirement Benefits | \$139,025,590 | \$264,659,360 |
| Disability Benefits | 3,078,909 | 6,489,822 |
| Death Benefits | 4,218,955 | 7,355,091 |
| Termination Benefits | 26,255,235 | 94,435,944 |
| Contributons plus Interest for Inactive Members | <u>2,600,441</u> | <u>2,600,441</u> |
| Total Present Value of Benefits for all Non-Retired Members | <u>\$175,179,130</u> | <u>\$375,540,658</u> |
| Present Value of Benefits for Retirees | 71,802,414 | 71,802,414 |
| Total Present Value of Benefits | <u>\$246,981,544</u> | <u>\$447,343,072</u> |

William M. Mercer, Incorporated

APPENDIX 4
SUMMARY OF THE PROVISIONS
OF THE
ALASKA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
AS OF
NOVEMBER 1, 1976

PUBLIC EMPLOYEES' RETIREMENT SYSTEM
OF ALASKA

1. Plan

Public Employees' Retirement System of Alaska.

2. Effective Date

January 1, 1961.

3. Amended

April 19, 1961
April 19, 1962
February 18, 1964
May 29, 1964
July 1, 1964
May 12, 1966
April 3, 1968
July 1, 1968
July 1, 1970
July 1, 1972
July 1, 1974
July 1, 1975
July 1, 1976
November 1, 1976

4. Administration of Plan

The Commissioner of Administration is responsible for administration of the System, Public Employees' Retirement Board adopts rules and regulations to carry out provisions of the Act, and Commissioner of Revenue invests the Fund. The Attorney General is the attorney for the System and represents it in legal proceedings.

5. Employers Included

State of Alaska and any political subdivisions and public or quasi-public organizations thereof (as of December 31, 1976, there were: 65 participating employer groups in addition to the State for which separate contribution rates are determined).

6. Employees Included

All permanent full-time or part-time employees of the State and participating political subdivisions, exclusive of those covered by the Alaska Teachers' Retirement System, the Alaska Judges' System, or any employee on whose behalf the State is making contributions to another Retirement System. Elected officials may elect to participate at their option.

7. Service Considered

Future:

The later of hire, 1/1/61, or date of employers' participation in the System, to date of termination, death, or retirement. Up to 5 years of military service may be recognized if appropriately claimed and appropriate employee contribution paid. Permanent part-time employees receive service credit on a pro-rata basis.

Past:

Service credit for all service with State and Territory prior to January 1, 1961, if the employee completed three

years of service after January 1, 1961. Elected official has past service credit only if he pays contributions for all of his service after January 1, 1961. Service with political subdivision prior to its participation in the System is included at the option of the political subdivision.

Break in Future Service:

Any termination. But if employee returns and makes contribution equal to refund paid plus interest, the service before the break is reinstated.

8. Average Monthly Compensation

Total compensation during three consecutive calendar years of credited service which yield the highest average monthly compensation (total compensation during period divided by number of months included).

9. Employer Contributions

Separate contribution rate for each employer equal to the sum of:

(1) Consolidated Rate

A uniform rate for all participating employers sufficient to amortize all future service liabilities (less value of employee contributions) over the future working lifetimes of the covered group.

(2) Past Service Rate

A rate determined separately for each employer sufficient

to amortize such employer's unfunded past service liabilities over 40 years.

10. Employee Contributions

Mandatory Employee Contributions:

Police & Fire - 5%

Other - 4 1/4%

Refund at Termination (no vesting):

Return of voluntary and mandatory contributions with interest.

Refund at Death:

If no widow's pension payable, return of voluntary and mandatory contributions with interest.

11. Normal Retirement Benefit

Eligibility:

The first of the month following the earlier of:
age 55 with 5 or more years of Credited Service;
or 20 years Credited Service - Police & Fire, or
30 years Credited Service - Other.

Type:

Life only with optional joint and survivor benefit
(actuarially reduced).

Amount:

2% of Average Monthly Compensation for each year of
service - Other.

William M. Mercer, Incorporated

2% of Average Monthly Compensation for the first 10 years of service plus 2 1/2% for years of service in excess of 10 - Police & Fire.

12. Early Retirement Benefit

Eligibility:

Age 50 and 5 or more years Credited Service - all employees.

Type:

Life only.

Amount:

Actuarial equivalent of Normal Retirement Benefit based on service and compensation to Early Retirement Date.

13. Deferred Vested Benefit

Eligibility:

Five or more years of Credited Service, withdrawal of employee contributions voids vested rights.

Type:

Life only or joint and survivor benefit (actuarially reduced).

Amount:

Monthly benefit begins on employee's Normal Retirement Date. Amount determined the same as Normal Retirement Benefit taking into account compensation and service prior to termination.

14. Disability Benefit

Occupational Disability:

Eligibility:

No age or service requirements.

Type:

Monthly benefit payable until death or recovery.

Amount:

40% of gross monthly compensation at date of disability. The benefit terminates at Normal Retirement Date with full Normal Retirement Benefit commencing at that point.

Non-Occupational Disability:

Eligibility:

Five or more years of Credited Service.

Type:

Monthly benefit payable until death or recovery.

Amount:

Same as vested benefit except payments commence immediately.

15. Death Benefit Before Retirement

Occupational:

No age or service requirements.

Benefit: 40% of gross monthly compensation at date

of death or disability, if earlier. At participant's Normal Retirement Date, benefit converts to Normal Retirement benefit based on pay at date of disability or death and credited service, including period from date of disability or death to Normal Retirement Date.

Non-Occupational:

If no widow's benefit is payable, lump-sum death benefit of \$1,000 plus \$100 per each completed year of Credited Service and the participant's contributions with interest. Alternatively, an income benefit is available at death after five years of Credited Service based on 50% Joint and Survivor equivalent of accrued Normal Retirement Benefit.

16. Death Benefits After Retirement

The employee's beneficiary receives a lump sum equal to the excess of his contribution account immediately prior to retirement over the sum of the pension payments previously received by the employee.

17. Post-Retirement Pension Adjustment

Commissioner of Administration may recommend post-retirement increases on account of increasing cost of living up to 4% each year.

18. Cost-of-Living Allowance

A retired employee who remains in Alaska is eligible for an additional allowance, equal to 10% of his basic retirement benefit, or \$50 per month, whichever is greater. A person who receives a surviving spouse's pension shall receive an additional allowance of 75% of the allowance payable to a retired employee, if he or she stays in Alaska.

19. Optional Employee Savings Account

An employee can voluntarily contribute up to 5% of his compensation. This amount is recorded in a separate account and is payable:

- (a) In the event of termination before retirement for any reason other than death, as a lump sum to the employee,
- (b) In the event of termination on account of death, as a lump sum to the employee's beneficiary,
- (c) On retirement, as a lump sum, life annuity on cash refund basis or installments over limited period.