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**STATISTICAL**

**SUPPLEMENT**

**78**



# 1978 STATISTICAL SUPPLEMENT To the Annual Report

## The Public Employees' Retirement Association of Colorado

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January, 1979  
1300 Logan  
Denver, Colorado 80203



PERA LEADERSHIP. Left to Right. Dr. Margaret Whilden, Retirement Board Chairperson; Dr. Terry L. Lantry, Vice Chairperson; and Joseph P. Natale, Executive Secretary.



# Public Employees' Retirement Board

Margarett Whilden, Chairperson	Longmont Public Schools
Terry L. Lantry, Vice Chairperson	Colorado State University
Roberta J. Altenbern	Adams County District 14 Schools
Bernal Brooks	City of Colorado Springs
Eileen Burroughs	Jefferson County Public Schools
Walter Chilton	Retired
Robert Hapgood	State Land Board
Ada Houck	Grand Junction Public Schools
Thomas D. Lindquist	State Patrol
Edward W. Murrow	University of Colorado
Frank V. Taulli	Pueblo Public Schools
Wilborn S. Whitehead	City of Arvada
Roy Romer	State Treasurer
Bob Scott	State Auditor

## Administrative Staff

Joseph P. Natale	Executive Secretary
Kenneth E. Peterson	Assistant Secretary of Investments
Carl S. Wilkerson	Assistant Secretary of Staff Support Service
James W. "Will" Wilson	Assistant Secretary of Government and Member Relations
Robert J. Clark	Internal Auditor
Dennis Blake	Director of Data Processing
Kent Carsten	Director of Office Services
Donald P. Clippinger	Director of Accounting
Ralph Doronzo	Director of Building Services
Allan L. Johnson	Director of Information Services
Jean Moretti	Director of Retirement Services
Paula Westerdahl	Director of Annuities

## Consulting Firms

Gabriel, Roeder, Smith & Company, Actuaries  
Peat, Marwick, Mitchell & Co., Certified Public Accountants  
Alliance Capital Management Corporation, Investment Counsel  
A. G. Becker & Co., Incorporated, Funds Evaluation Service



This Supplement to the 1978 Annual Report is divided into two major parts: a financial report and an actuarial report. The purpose of this supplement is to supply the interested member with detailed investment, financial, and actuarial information used by the Retirement Board in managing the Public Employees' Retirement Association.

In the financial report, the June 30, 1978, audited financial statements are presented with accompanying accountants' report. This section also deals with the growth and composition of the asset structure of the fund. Investments of the portfolio are listed as of June 30, 1978.

The actuarial report deals with the fundamental reality facing PERA—the growth of PERA, in terms of both people and dollar assets, and the growth of claims on the fund, accumulating over the years through a statutory promise to pay benefits at retirement.

The Public Employees' Retirement Association has four divisions—the State Division, School Division, Municipal Division, and Judges' Division. Much of the data in this booklet is consolidated for all four divisions although each fund is separated from the others and is only used to pay claims against that division. Actuarial facts for active members of the Association are listed as of December 31, 1977. Data on retired lives is listed as of June 30, 1978.

Most members contribute 7¾ percent of salary paid. While this money is invested, the member's principal amount can only be used for the benefit of the individual member or his survivor. The employers' contributions vary according to division. These contributions are determined on the basis of actuarial valuations to provide the amount of money needed, in addition to the employee's own contributions, to pay the allowances promised by the Association.

Explanatory materials including several graphs appear throughout to help explain the program. This is the fifth year that this Annual Statistical

Supplement has been published. We hope that this year's report will also be of interest to you and will be helpful in understanding and evaluating the program.

January, 1979

**Public Employees' Retirement  
Board of Colorado**

**1300 Logan  
Denver, Colorado 80203**

## How the Plan Operates

The PERA retirement plan was established in 1931, and began by covering only state employees. The plan has been greatly expanded since that time and now includes employees of the State of Colorado, of all school districts in the state except Denver, and the employees of several municipalities, public health departments, and other local governmental agencies.

This plan is recognized as among the best in existence. Its purpose is to provide income to members and their families when they need it most—at retirement or in case of death or disability.

The Public Employees' Retirement Association is a joint-contributory retirement plan, operating on an actuarial reserve basis.

**THE RETIREMENT ACT:** The law governing the Public Employees' Retirement Association of Colorado is Article 51 of Title 24, Colorado

Revised Statutes, 1973, as amended. The last amendatory legislation was enacted in 1978.

Complete copies of the law are available at the Retirement Office.

**ADMINISTRATION OF SYSTEM:** The administration and responsibility for the proper operation of the Association are vested in the Public Employees' Retirement Board of Colorado which is made up of fourteen members, as follows:

Five representatives elected by members from the School Division.

Four representatives elected by members from the State Division.

Two representatives elected by members from the Municipal Division.

One representative elected by those retired under PERA.

The State Treasurer and State Auditor.

The members of the Association elect employee group representatives to the Board for four-year terms by mail ballot.

The legal advisor of the Retirement Board is the state attorney general. An executive secretary is appointed by the Retirement Board to be secretary and administrative officer of the Association. He, in turn, is responsible for the activities of the staff.

The Board also appoints an actuary who makes annual actuarial valuations to determine the adequacy of the funding of retirement benefit liabilities accrued under the retirement program. The PERA Board submits an annual actuarial valuation report to the Legislative Audit Committee and the Joint Budget Committee of the Colorado General Assembly.

A medical advisor is appointed by the board to study and make recommendations regarding applications for disability retirements. The Board also appoints an advisory Investment Committee and Legislative Committee.

Administrative expenses of the association are paid from the \$5 membership fees charged the employee upon employment and from a small portion of investment income.

**INVESTMENTS:** The funds of the retirement system are invested primarily in public utility and corporate bonds, common and preferred stock of top-rated companies, and in real estate mortgages insured and guaranteed by agencies of the United States Government.

The law charges the PERA Board with responsibility of investing the funds in a prudent and discretionary manner and limits investments in common and preferred stocks to 30 percent of the portfolio.

**CONTRIBUTIONS BY MEMBERS:** Members of State, School, and Municipal Divisions make deposits of 7¾ percent of salary paid including pay for overtime and additional duties but excluding reimbursement of expenses. Certain wildlife officers and state patrolmen pay higher rates. Deposits are posted to individual accounts for each employee. The accumulated amount in each account will be used for the employee's benefit if he remains in service. If he leaves service, he may withdraw the amount of his contributions without interest, or he may, if he has five or more years of service, elect a deferred annuity providing a lifetime income at age 65 or in some cases earlier. If he dies before retirement and no other death benefits are payable, his beneficiary will receive his contributions.

**CONTRIBUTIONS BY EMPLOYER:** While members are saving for retirement, the employer—State of Colorado, school district, municipality, other political subdivision—will be making contributions on behalf of their employees. Rates for PERA divisions differ.

The employer's contributions are determined on the basis of actuarial valuation and will provide the amount of money needed, in addition to the employee's own contributions, to provide the allowances promised by the association. The average retired member pays only 15 percent of the amount he receives as an annuity. The remainder comes from the employer money and investment income.

Most State Division employers pay 10.64 percent of payroll. (Both employee and employer rates are greater than regular state rates for certain wildlife officers and for members of the Colorado State Patrol.) School Division employers pay 12.10 percent of payroll. Municipal Division employers pay 9.86 percent.

The employee rate for the Judges' Division is 7 percent of salary paid; the employer rate is 12 percent of payroll.

**WHERE TO WRITE FOR INFORMATION:** Any member who wishes information which is not given in this booklet may write for further information to:

**PUBLIC EMPLOYEES' RETIREMENT ASSOCIATION**  
Information Services Division  
1300 Logan  
Denver, Colorado 80203



# Summary of PERA Benefits

The following is a brief description of the benefits of the Public Employees' Retirement Association in the State, School, and Municipal Divisions. The reader is reminded that this is only a brief explanation; complete details of the benefits and other aspects of the program may be found in the law and in the rules and regulations of the Retirement Board.

**Final Average Salary (FAS) is a frequently used term describing PERA benefits. It means the average of the highest five consecutive years of earnings within the period of service being considered, usually, but not necessarily the last five years.**

## If You Resign

You are entitled to a refund of your own deposits to PERA. In addition to this benefit, if you have five or more years of service, you may leave your money on deposit and without further payment you will be eligible for a monthly benefit payable for the rest of your life beginning when you are 60 to 65. This monthly benefit will be based on the amount of your PERA-covered service.

## If You Die

Your widow or widower will receive a monthly benefit until your youngest child is 18 years of age or until age 23 if the child is unmarried and in school. If you leave no eligible children or after benefits have been paid because of the children, your widow or widower will receive a monthly benefit beginning at his or her age of 60, earlier if you have more service. To be eligible for these survivor benefits you must have at least one year's service under PERA unless the death is service incurred in which case there

is no service credit requirement. If you leave no eligible survivors for monthly benefits, your beneficiary will receive a refund of the amount of money you have deposited with PERA.

## If You Are Permanently Disabled

Most members will receive a maximum of 50 percent FAS. This could be higher if you have more than 20 years covered service. One percent of FAS would be added for each year over 20. If you were hired after age 45, the percentage of FAS would be less than 50 percent.

This benefit is payable for the rest of your life or until you recover from the disability. In order to qualify for this benefit, you must have had five years' of service credit under PERA since last date of employment.

## If You Retire

You can retire as early as age 55 provided you have at least 20 years of PERA service credit at that age, or at age 60 with as few as five years of PERA service credit.

Regular retirement without reductions are at age 55 with at least 30 years service, age 60 with at least 20 years service, and age 65 with at least five years service.

The formula used to compute your retirement benefits is:

2½% of Final Average Salary per year—1st 20 years of service.

1% of Final Average Salary—21-40 years of service.

Maximum-70%

This formula is reduced in certain cases of early retirement.



**PEAT, MARWICK, MITCHELL & CO.**

CERTIFIED PUBLIC ACCOUNTANTS

1600 BROADWAY

DENVER, COLORADO 80202

The Retirement Board  
Public Employees' Retirement  
Association of Colorado:

We have examined the combining balance sheet of the Public Employees' Retirement Association of Colorado (consisting of State Employees', School Employees', Municipal Employees', and Judges' Divisions and the Common Operating Fund) as of June 30, 1978 and the related combining statements of revenue and administrative expense and changes in reserve accounts for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned combining financial statements present fairly the individual financial positions of the Public Employees' Retirement Association of Colorado (consisting of State Employees', School Employees', Municipal Employees', and Judges' Divisions and the Common Operating Fund) at June 30, 1978 and their individual transactions for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

We have reported separately under date of September 25, 1978 on the financial statements of each of the divisions and the Common Operating Fund for the years ended June 30, 1978 and 1977. The columns on the accompanying financial statements captioned "Combined total - Memorandum only" are not necessary for a fair presentation of the financial statements, but are presented as additional analytical data.

*Peat, Marwick, Mitchell & Co.*

September 25, 1978

# Combining Balance Sheet

Year Ended June 30, 1978  
with comparative combined totals for 1977

Assets	Municipal Employees' Division	School Employees' Division	Judges' Division	State Employees' Division	Common Operating Fund	Combined total (Memorandum only)	
						1978	1977
Cash	\$ 49,959	843,298	15,351	2,661,582	33,139	3,603,329	1,760,178
Receivables:							
Member and employer contributions	939,656	8,103,620	101,858	7,717,647	—	16,862,781	15,236,416
Dividends and accrued interest on investments	1,076,721	12,936,150	172,964	9,889,764	7,718	24,083,317	19,804,965
Other	24,921	183,212	60,423	296,305	7,277	572,138	361,884
	<u>2,041,298</u>	<u>21,222,982</u>	<u>335,245</u>	<u>17,903,716</u>	<u>14,995</u>	<u>41,518,236</u>	<u>35,403,265</u>
Investments (note 2):							
Temporary investments, at cost	3,085,822	42,645,721	746,431	22,622,699	223,518	69,324,191	66,028,071
Corporate obligations, at amortized cost	41,417,056	480,654,989	6,064,379	380,130,325	—	908,266,749	726,374,294
Stocks, at cost	10,340,509	130,401,191	1,772,501	101,351,222	—	243,865,423	215,088,685
United States Government obligations, at amortized cost	7,473,550	105,348,478	796,522	80,412,991	1,041,046	195,072,587	168,009,965
First mortgages, at amortized cost	6,557,976	99,956,000	1,174,771	74,530,025	—	182,218,772	184,163,336
Real estate, at cost	—	225,092	—	—	—	225,092	—
Total investments before unamortized yield adjustment	68,874,913	859,231,471	10,554,604	659,047,262	1,264,564	1,598,972,814	1,359,664,351
Unamortized yield adjustment	1,208,799	12,095,653	193,021	8,989,177	—	22,486,650	16,127,807
	<u>70,083,712</u>	<u>871,327,124</u>	<u>10,747,625</u>	<u>668,036,439</u>	<u>1,264,564</u>	<u>1,621,459,464</u>	<u>1,375,792,158</u>
Property and equipment, at cost:							
Land	—	—	—	—	180,000	180,000	180,000
Building	—	—	—	—	3,438,849	3,438,849	3,414,797
Equipment and fixtures	—	—	—	—	416,664	416,664	322,326
	—	—	—	—	4,035,513	4,035,513	3,917,123
Less accumulated depreciation	—	—	—	—	254,027	254,027	141,749
Net property and equipment	—	—	—	—	3,781,486	3,781,486	3,775,374
Total real assets	72,174,969	893,393,404	11,098,221	688,601,737	5,094,184	1,670,362,515	1,416,730,975
Estimated obligation of employers for prior service (contra)	29,414,365	428,714,351	1,866,507	412,011,004	—	872,006,227	816,110,493
	<u>\$101,589,334</u>	<u>1,322,107,755</u>	<u>12,964,728</u>	<u>1,100,612,741</u>	<u>5,094,184</u>	<u>2,542,368,742</u>	<u>2,232,841,468</u>

See accompanying notes to combining financial statements.



## Liabilities and Reserves

	Municipal Employees' Division	School Employees' Division	Judges' Division	State Employees' Division	Common Operating Fund	Combined total (Memorandum only)	
						1978	1977
Refunds and other liabilities payable	\$ 426,857	2,118,271	3,876	2,963,046	101,424	5,613,474	2,201,944
Reserve accounts:							
Contributions:							
Members' deposits	20,102,259	234,143,897	2,532,317	193,686,028	—	450,464,501	398,897,505
Employers':							
Accumulation	25,794,705	360,875,445	3,881,731	161,231,968	—	551,783,849	452,882,666
Actuarial requirements (contra)	29,414,365	428,714,351	1,866,507	412,011,004	—	872,006,227	816,110,493
	<u>75,311,329</u>	<u>1,023,733,693</u>	<u>8,280,555</u>	<u>766,929,000</u>	<u>—</u>	<u>1,874,254,577</u>	<u>1,667,890,664</u>
Annuity:							
Annuitants' retirement	22,856,941	279,326,892	3,722,970	307,375,952	—	613,282,755	523,733,251
Survivors' benefit	2,341,979	9,214,810	838,795	14,609,700	—	27,005,284	21,713,034
Deferred annuitants'	487,401	7,069,398	74,393	7,772,905	—	15,404,097	11,180,126
Deferred survivors' benefit	164,827	644,691	44,139	962,138	—	1,815,795	1,541,760
	<u>25,851,148</u>	<u>296,255,791</u>	<u>4,680,297</u>	<u>330,720,695</u>	<u>—</u>	<u>657,507,931</u>	<u>558,168,171</u>
Insurance dividend reserve (note 3)	—	—	—	—	4,992,760	4,992,760	4,580,689
Total reserve accounts	<u>101,162,477</u>	<u>1,319,989,484</u>	<u>12,960,852</u>	<u>1,097,649,695</u>	<u>4,992,760</u>	<u>2,536,755,268</u>	<u>2,230,639,524</u>
Commitments (note 4)							
	<u>\$101,589,334</u>	<u>1,322,107,755</u>	<u>12,964,728</u>	<u>1,100,612,741</u>	<u>5,094,184</u>	<u>2,542,368,742</u>	<u>2,232,841,468</u>



# Combining Statement of Revenue and Administrative Expenses

Year ended June 30, 1978  
with comparative combined totals for 1977

	Municipal Employees' Division	School Employees' Division	Judges' Division	State Employees' Division	Common Operating Fund	Combined total (Memorandum only)	
						1978	1977
Revenue:							
Interest income:							
Corporate obligations	\$2,855,801	33,080,886	440,765	26,392,937	—	62,770,389	55,614,793
United States Government obligations	523,569	7,413,433	62,909	5,627,905	49,215	13,677,031	8,753,084
First mortgages	532,540	6,741,758	95,410	5,098,691	—	12,468,399	10,982,769
Temporary investments	119,368	2,427,723	19,323	1,531,732	75,380	4,173,526	2,595,593
Dividend income	399,134	5,049,664	69,661	3,918,488	—	9,436,947	6,982,396
Gain on sale of investments, net	346,285	3,512,397	62,201	2,512,062	—	6,432,945	3,074,540
Amortization of premiums and discounts on							
investments, net	158,219	1,338,232	31,129	1,016,670	—	2,544,250	2,563,977
Membership fees	6,440	41,980	85	31,887	—	80,392	76,883
Other, net	2,129	216,676	—	88,962	78,197	385,964	276,929
	4,943,485	59,822,749	781,483	46,219,334	202,792	111,969,843	90,920,964
Less amortization of yield adjustment	103,962	596,389	17,112	481,965	—	1,199,428	964,323
	<u>4,839,523</u>	<u>59,226,360</u>	<u>764,371</u>	<u>45,737,369</u>	<u>202,792</u>	<u>110,770,415</u>	<u>89,956,641</u>
Administrative expenses:							
Personnel	—	—	—	—	1,143,495	1,143,495	925,817
Professional services	—	—	—	—	237,708	237,708	184,647
Building and equipment	—	—	—	—	187,191	187,191	167,763
Supplies	—	—	—	—	142,870	142,870	122,751
Depreciation	—	—	—	—	112,427	112,427	58,123
Other, net	—	—	—	—	104,626	104,626	87,283
Allocations to divisions	104,159	1,085,530	5,385	805,292	(2,000,366)	—	—
	<u>104,159</u>	<u>1,085,530</u>	<u>5,385</u>	<u>805,292</u>	<u>(72,049)</u>	<u>1,928,317</u>	<u>1,546,384</u>
<b>Excess of revenue over expenses distributed to reserve accounts</b>	<b><u>\$4,735,364</u></b>	<b><u>58,140,830</u></b>	<b><u>758,986</u></b>	<b><u>44,932,077</u></b>	<b><u>274,841</u></b>	<b><u>108,842,098</u></b>	<b><u>88,410,257</u></b>

See accompanying notes to combining financial statements.

# Combining Statement of Changes in Reserve Accounts

Year ended June 30, 1978  
with comparative combined totals for 1977

	Municipal Employees' Division	School Employees' Division	Judges' Division	State Employees' Division	Common Operating Fund	Combined total (Memorandum only)	
						1978	1977
Contributions:							
Members	\$ 4,700,986	44,413,130	440,614	38,831,244	—	88,385,974	81,839,839
Employers	5,959,709	68,854,268	745,667	52,994,417	—	128,554,061	119,153,885
	<u>10,660,695</u>	<u>113,267,398</u>	<u>1,186,281</u>	<u>91,825,661</u>	<u>—</u>	<u>216,940,035</u>	<u>200,993,724</u>
Excess of revenue over expenses	4,735,364	58,140,830	758,986	44,932,077	274,841	108,842,098	88,410,257
Cost of living adjustments appropriated by the Colorado State Legislature	130,108	1,656,910	18,237	2,634,895	—	4,440,150	2,815,909
Transfers for split annuities:							
From Judges' Division to State Employees' Division	—	—	(40,080)	40,080	—	—	—
From School Employees' Division to State Employees' Division	—	(664,083)	—	664,083	—	—	—
From State Employees' Division to Municipal Employees' Division	30,126	—	—	(30,126)	—	—	—
From Municipal Employees' Division to School Employees' Division	(1,185)	1,185	—	—	—	—	—
From Municipal Employees' Division to Judges' Division	(4,404)	—	4,404	—	—	—	—
Refunds due to withdrawal of participating members	(1,564,795)	(10,489,948)	(19,345)	(10,564,900)	—	(22,638,988)	(15,623,166)
Benefits paid	(2,147,214)	(26,177,781)	(416,399)	(28,759,121)	—	(57,500,515)	(48,612,148)
Increase (decrease) in estimated obligation of employers for prior service, adjusted to actuaries' certificate	1,853,301	8,736,221	(324,540)	45,630,752	—	55,895,734	144,553,841
Insurance dividends received, net	—	—	—	—	371,382	371,382	291,886
Paid-up life insurance purchased	—	—	—	—	(234,152)	(234,152)	(285,252)
<b>Net increase for the year</b>	<b>13,691,996</b>	<b>144,470,732</b>	<b>1,167,544</b>	<b>146,373,401</b>	<b>412,071</b>	<b>306,115,744</b>	<b>372,545,051</b>
Balance, beginning of year	87,470,481	1,175,518,752	11,793,308	951,276,294	4,580,689	2,230,639,524	1,858,094,473
<b>Balance, end of year</b>	<b>\$101,162,477</b>	<b>1,319,989,484</b>	<b>12,960,852</b>	<b>1,097,649,695</b>	<b>4,992,760</b>	<b>2,536,755,268</b>	<b>2,230,639,524</b>

See accompanying notes to combining financial statements.



# Notes to Combining Financial Statements

June 30, 1978

## (1) Summary of Significant Accounting Policies Valuation of Reserve Accounts

### Basis of Combining Financial Statements

The accompanying combining financial statements include the accounts of the State, School, Municipal Employees', and Judges' Divisions, and the Common Operating Fund. Each of their accounts are separately maintained and all actuarial determinations are made on the basis of each division's separate actuarial information.

### Employer Contributions

The effective statutory employer contribution rates ranged from 9.86 percent to 12.10 percent of active member payroll. The Association's actuary uses the "entry age normal" ("attained age normal" for Judges' Division) actuarial method to determine annuity liabilities and normal costs. As of December 31, 1977, after considering current cost contributions, the actuarially computed number of years necessary to accumulate assets to fund the actuarial liability for prior service ranged from 27 to 58 years. The December 31, 1976, computations excluded the undistributed net income earned by the divisions for the period July 1 to December 31 of that year.

The aggregate unfunded actuarial liability of \$872,006,227, computed as of December 31, 1977, is presented in the balance sheet as "estimated obligation of employers for prior service" and as an employer reserve titled "actuarial requirements."

### Members' Deposits

Members' contribution rates are established by state statute and are deducted from the members' salaries and remitted by the various participating agencies.

### Annuity and Deferred Annuity

Annuity and deferred annuity accounts are recorded at amounts sufficient to reflect the actuarially computed discounted accrued liability of each reserve.

### Investments

Temporary investments, consisting of corporate notes, are shown at purchased cost. Maturities are generally less than 30 days. Income is recognized as earned.

Stock investments, principally common stock, are recorded at purchased cost. Dividend income is recognized when dividends are payable. Gains or losses on stocks sold are recognized on the basis of the average cost of the aggregate stock being sold.

First mortgages are presented at amortized cost. Discounts recorded at the time of purchase are amortized on a straight-line basis for guaranteed purchase agreements covering a group of individual mortgages and by the use of the "scientific method" for other mortgages. Income is recognized on a monthly basis over the various lives of the respective mortgages.

Other investments, principally corporate obligations, are reflected at amortized cost. Premiums and discounts recorded at the time of bond purchases are amortized to the call date and maturity date, respectively. Income is recorded as earned over the life of the investment.

Unamortized yield adjustment on bond exchanges reflects the deferral of losses when bonds are generally exchanged for similar bonds to achieve a higher yield. These losses are amortized generally to the respective earliest maturity date of the new bond acquired or the old bond exchanged. Losses of \$7,558,272 and \$2,577,518 on bond exchanges were deferred during the years ended June 30, 1978, and 1977, respectively.

### Property and Equipment

Property and equipment are stated at cost. Depreciation is provided using the straight-line method in order to apportion the cost of the depreciable assets over the various useful lives of from 3 to 50 years.

### Administrative Activities

The Common Operating Fund (Fund) accounts for all administrative activities which are common to the divisions. Operating assets and liabilities, which are held for the benefit of all divisions, are recorded in the Fund. The expenses incurred by the Association are allocated to the various divisions on the basis of the relationship of the number of members in the division to the total membership in the Association.

The Retirement Board has established a policy that the Fund will receive net revenues from its own investments and allocations of revenue from the divisions in an amount equal to 6 percent of the average annual balance in the insurance dividend reserve.



## (2) Investments

A summary of investments as of June 30, 1978, with comparative June 30, 1977, combined totals is as follows:

	1978					Combined (Memorandum only)		1977 Combined (Memorandum only)	
	Municipal Employees' Division	School Employees' Division	Judges' Division	State Employees' Division	Common Operating Fund	Total	Market value	Total	Market Value
Temporary investments, at cost	\$ 3,085,822	42,645,721	746,431	22,622,699	223,518	69,324,191	69,324,191	66,028,071	66,028,071
Corporate obligations, at amortized cost:									
Par value	\$43,702,285	500,883,450	6,371,779	396,066,137	—	947,023,651	755,039,064		
Less discount, net	2,285,229	20,228,461	307,400	15,935,812	—	38,756,902	28,664,770		
	\$41,417,056	480,654,989	6,064,379	380,130,325	—	908,266,749	829,988,594	726,374,294	709,401,301
Stocks, at cost	\$10,340,509	130,401,191	1,772,501	101,351,222	—	243,865,423	243,596,859	215,088,685	221,316,106
United States Government obligations, at amortized cost:									
Par value	\$ 7,490,417	105,754,069	798,049	80,603,885	1,050,000	195,696,420	168,422,059		
Less discount, net	16,867	405,591	1,527	190,894	8,954	623,833	412,094		
	\$ 7,473,550	105,348,478	796,522	80,412,991	1,041,046	195,072,587	183,681,453	168,009,965	165,642,253
First mortgages, at amortized cost:									
Face value	\$ 6,712,689	102,263,691	1,212,942	76,597,868	—	186,787,190	189,656,913		
Less discount, net	154,713	2,307,691	38,171	2,067,843	—	4,568,418	5,493,577		
	\$ 6,557,976	99,956,000	1,174,771	74,530,025	—	182,218,772	184,163,336	184,163,336	169,468,080

## (3) Insurance Dividend Reserve

The insurance dividend reserve is a result of dividends paid by the insurance company as a return of the excess premiums paid by participating members. The reserve is used to purchase paid-up life insurance for eligible members when they retire and additional paid-up insurance for active insured members.

## (4) Commitments

At June 30, 1978, the various divisions were committed to purchase investments at an aggregate cost of \$21,987,750.

# PERA Investment Policy

## Goal

The function of the Public Employees' Retirement Association is to provide present and future retirement or survivor benefits for its members. In keeping with that function, the preservation of capital is of paramount importance. Every effort will be made to manage the portfolio so that benefits can be paid from regular income and not from contributions or anticipated appreciation of investments. A substantial improvement in the funds' rate of return over a reasonable period of time should allow consideration of reduction of unfunded accrued liabilities, improved benefits, or reduced contributions, maintaining a level contribution fund.

## Policy

The fund is long-term in nature and the selection of investments is regulated by (1) statutory limitations, (2) limits of acceptable risk and (3) the objective of a maximized total rate of return. Approval of all purchases and sales of investments is vested by law in the PERA Board. The assistant executive secretary-investments is authorized to execute investment transactions on behalf of the board as permitted under these policy and procedures statements.

Investment decisions shall be made within the framework of the goal established for the rate of return, limits of acceptable risk and fund objectives. At any point in time, certain types of investments have greater relative attractiveness than others. To maximize the realized rate of return, it is necessary to determine the relative values ascribed to differing types of investments within a given investment environment.

The association believes that individual holdings should stand alone on merit as well as complement the entire group of holdings.

Diversification shall be considered as part of the effort to minimize liquidity risks, maximize total rate of return and limit exposure to unanticipated business risks. Since the portfolio is long term in nature and is constructed to avoid the necessity of liquidating holdings to meet benefits

payments, liquidity is not a first consideration; however, every reasonable effort will be made to provide protection for the portfolio in future deteriorating markets.

No holding will be considered a "permanent" part of the portfolio. Any security can be sold at any time either to maximize gains or to minimize losses. The portfolio shall be continuously monitored in order to identify such instruments as over valued stocks or low yield bonds in order to take appropriate action.

Preference will be given to Colorado investments, all other things being equal.

Investment in foreign securities shall not be considered. This will not be construed to mean that securities of American companies doing business in foreign countries will not be considered. However, the foregoing shall not be meant to exclude securities of the International Bank for Reconstruction and Development (World Bank).

In making investment decisions the association shall avail itself of the highest caliber advice obtainable both internally and externally.

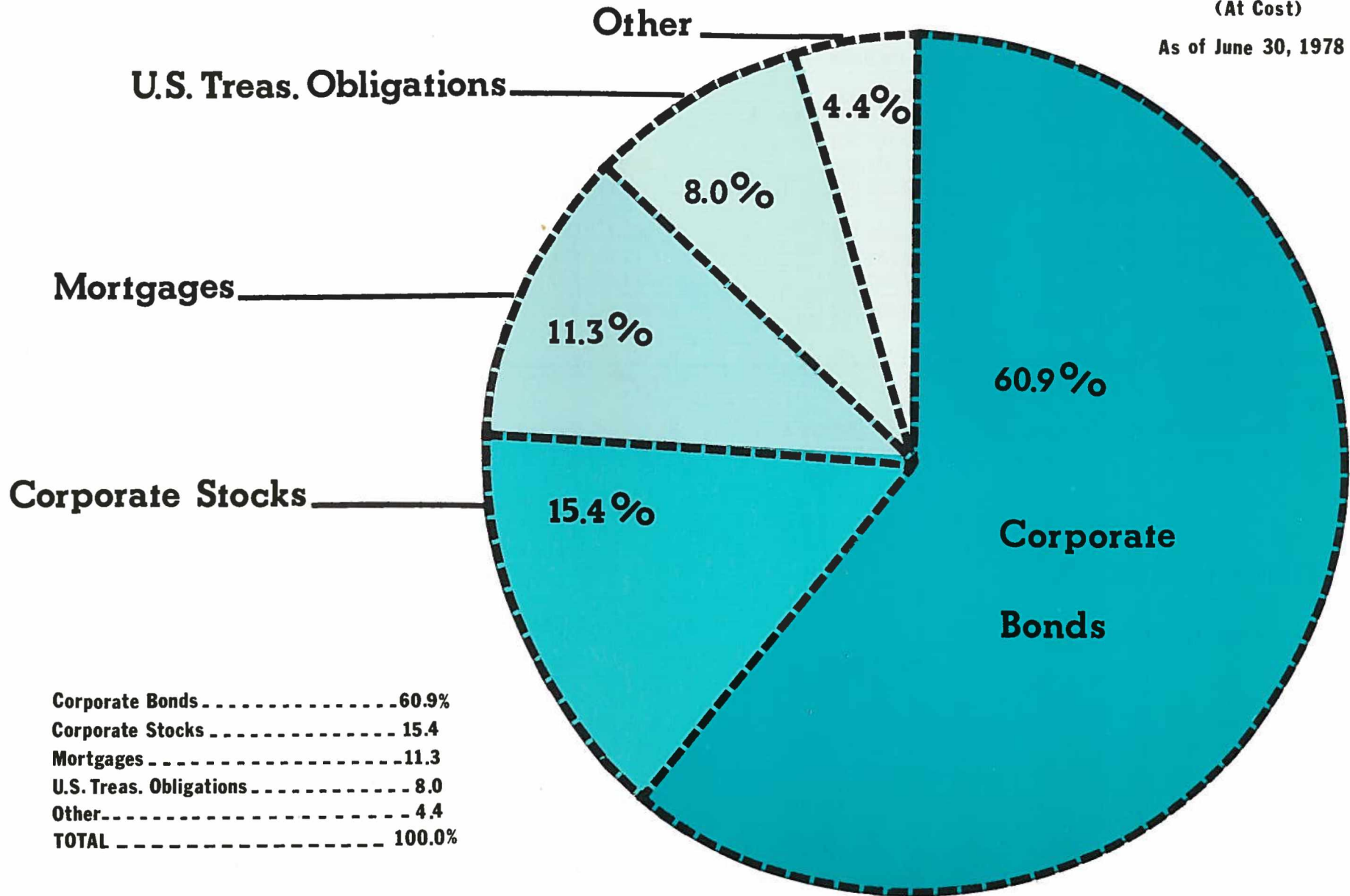
Generally Accepted Accounting Principles (GAAP) will be followed in accounting for the portfolio; however, GAAP should not restrict investment decisions. The deferral and amortization method of losses will be used for bond exchange transactions. Securities will be recorded at adjusted cost; market values will be reported to the board quarterly. The firm engaged for the annual audit shall be consulted when questions concerning accounting procedures arise.

An annual evaluation will be conducted by a performance evaluation service of the investment industry. In addition the annual external audit and the annual actuarial valuations shall be reviewed in conjunction with the evaluation of investment performance. All evaluations will be related to the association's stated goals. Because these goals are long-term, cumulative performance results will be considered as more important than performance in any one year.



# INVESTMENT PORTFOLIO DISTRIBUTION

(At Cost)  
As of June 30, 1978





# Portfolio Distribution

## Fixed Income Securities

	<u>Par Value</u>	<u>Cost</u>	<u>Market Value June 30, 1978</u>
Short Term Investments—Less than 30 days	\$ 69,410,000	\$ 69,100,673	\$ 69,100,673
<b>Corporate Bonds</b>			
Public Utilities—Telephone	173,107,000	157,835,450	136,065,188
Public Utilities—Electric & Gas	217,376,835	201,753,086	177,152,560
Public Utilities—Gas & Pipeline	9,350,000	9,112,203	8,369,438
Industrial	313,836,118	300,771,986	288,334,348
Transportation	72,566,436	72,137,655	66,997,028
Financial	227,330,160	224,407,965	214,080,445
<b>Total Corporate Bonds</b>	<u>\$1,013,566,549</u>	<u>\$ 966,018,345</u>	<u>\$ 890,999,007</u>
U.S. Treasury Obligations	\$ 128,100,000	\$ 127,612,927	\$ 121,668,373
<b>Other Debt Obligations</b>			
Mortgages, Contracts & Notes	\$ 186,787,190	\$ 179,126,916	\$ 160,901,664
<b>Total Fixed Income Securities</b>	<u><u>\$1,397,863,739</u></u>	<u><u>\$1,341,858,861</u></u>	<u><u>\$1,242,669,717</u></u>

## Common Stocks

### Science and Technology

	<u>Shares Held</u>	<u>Cost</u>	<u>Market Value June 30, 1978</u>
<b>Business Equipment</b>			
Burroughs Corporation	93,900	\$ 7,728,331	\$ 6,784,275
International Business Machines Corp.	40,000	9,656,090	10,290,000
Xerox Corporation	19,700	1,939,429	1,031,788
		<u>\$ 19,323,850</u>	<u>\$ 18,106,063</u>
<b>Other</b>			
United Technologies Corporation	100,500	\$ 3,438,580	\$ 4,258,688
<b>Total Science &amp; Technology</b>		<u><u>\$ 22,762,430</u></u>	<u><u>\$ 22,364,751</u></u>

## Consumer Products & Services

	Shares Held	Cost	Market Value June 30, 1978
<b>Automotive</b>			
General Motors Corporation	82,000	\$ 6,205,102	\$ 4,868,750
<b>Broadcasting</b>			
CBS Inc.	155,000	\$ 6,321,926	\$ 8,137,500
<b>Building and Building Products</b>			
Armstrong Cork Company	195,000	\$ 4,842,307	\$ 3,339,375
<b>Drugs, Cosmetics and Hospital Supplies</b>			
American Home Products Corporation	214,000	\$ 6,143,155	\$ 6,072,250
Avon Products	114,100	6,466,855	6,061,563
Bristol-Myers Company	31,000	1,073,344	1,112,125
Johnson & Johnson	73,700	5,981,634	5,997,338
Schering-Plough Corporation	101,800	6,070,958	3,308,500
Warner-Lambert Company	158,000	6,102,011	4,503,000
		\$ 31,837,957	\$ 27,054,776
<b>Entertainment</b>			
Disney (Walt) Productions	100,000	\$ 3,883,000	\$ 4,000,000
<b>Food, Beverages and Tobacco</b>			
General Mills Incorporated	142,000	\$ 3,912,543	\$ 4,260,000
Heublein Incorporated	219,600	7,750,028	5,929,200
Philip Morris Incorporated	154,500	7,166,596	10,235,625
Pillsbury Company	100,500	3,645,465	3,957,188
Ralston Purina Company	267,300	3,469,560	4,276,800
Reynolds (R.J.) Industries, Inc.	147,800	9,033,393	8,443,075
		\$ 34,977,585	\$ 37,101,888
<b>Photography</b>			
Eastman Kodak Company	114,300	\$ 9,032,827	\$ 6,100,763
<b>Publishing</b>			
Dow Jones & Company	100,000	\$ 3,089,698	\$ 3,487,500
<b>Restaurants &amp; Lodging</b>			
McDonalds Corporation	90,800	\$ 4,049,580	\$ 4,778,350
<b>Retailing</b>			
Federated Department Stores, Inc.	100,600	\$ 4,266,371	\$ 3,722,200
K Mart Corporation	54,900	2,011,341	1,345,050
Melville Corporation	140,000	3,488,887	4,165,000



	Shares Held	Cost	Market Value June 30, 1978
Penney (J.C.) Company .....	82,300	4,767,216	3,003,950
Sears, Roebuck & Company .....	91,000	3,742,548	2,104,375
		<u>\$ 18,276,363</u>	<u>\$ 14,340,575</u>
<b>Total Consumer Products &amp; Services .....</b>		<b>\$122,516,345</b>	<b>\$113,209,477</b>

## Financial Services

### Insurance

Farmers Group Incorporated .....	201,000	\$ 4,409,001	5,175,750
<b>Total Financial Services .....</b>		<b>\$ 4,409,001</b>	<b>\$ 5,175,750</b>

## Basic Industries

### Aerospace

Boeing Company .....	199,000	\$ 5,093,861	\$ 10,522,125
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### Chemicals

Air Products and Chemicals, Inc. ....	200,000	\$ 4,826,425	\$ 5,550,000
Diamond Shamrock .....	100,000	2,730,350	2,562,500
Dow Chemical Company .....	109,000	1,883,308	2,684,125
		<u>\$ 9,440,083</u>	<u>\$ 10,796,625</u>

### Electrical Equipment

General Electric Company .....	145,500	\$ 7,664,116	\$ 7,347,750
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### Machinery

Caterpillar Tractor Company .....	151,500	\$ 7,032,806	\$ 8,465,063
Cooper Industries .....	100,600	4,141,407	5,558,150
Dresser Industries .....	100,000	3,961,558	4,425,000
		<u>\$ 15,135,771</u>	<u>\$ 18,448,213</u>

### Oil & Gas

Exxon Corporation .....	121,700	\$ 5,003,027	\$ 5,339,588
Kerr-McGee Corporation .....	33,500	1,899,899	1,448,875
Panhandle Eastern Pipeline Company ..	59,600	1,985,962	2,644,750
Phillips Petroleum Company .....	198,000	4,953,582	6,360,750
Standard Oil Company of Indiana .....	96,000	4,406,263	4,632,000
Standard Oil Company of Ohio .....	104,500	6,154,538	6,426,750
		<u>\$ 24,403,271</u>	<u>\$ 26,852,713</u>

	<u>Shares Held</u>	<u>Cost</u>	<u>Market Value June 30, 1978</u>
<b>Oil Services</b>			
Halliburton Company .....	136,500	\$ 6,710,477	\$ 8,753,063
<b>Paper and Forest Products</b>			
Boise Cascade Corporation .....	162,600	\$ 4,202,406	\$ 4,349,550
Georgia-Pacific Corporation .....	158,376	4,930,751	4,097,979
International Paper Company .....	46,400	3,112,723	1,838,600
Weyerhaeuser Company .....	150,000	5,676,540	3,731,250
		<u>\$ 17,922,420</u>	<u>\$ 14,017,379</u>
<b>Total Basic Industries</b> .....		<b>\$ 86,369,999</b>	<b>\$ 96,737,868</b>

## Public Utilities

### Electric & Gas

Florida Power & Light Company .....	12,800	\$ 454,035	\$ 350,400
Gulf States Utilities Company .....	68,000	1,508,419	875,500
Middle South Utilities Company .....	12,000	294,198	187,500
Northern Indiana Public Service Company .....	46,500	1,287,824	848,625
Public Service Company of Colorado .....	9,200	242,931	155,250
Tampa Electric Company .....	46,000	1,133,244	874,000
Texas Utilities Company .....	46,600	1,315,392	943,650
		<u>\$ 6,236,043</u>	<u>\$ 4,234,925</u>

### Telephone

American Telephone & Telegraph Company .....	31,300	\$ 1,571,644	\$ 1,874,088
<b>Total Public Utilities</b> .....		<b>\$ 7,807,687</b>	<b>\$ 6,109,013</b>

<b>TOTAL COMMON STOCKS</b> .....		<b><u>\$243,865,462</u></b>	<b><u>\$243,596,859</u></b>
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## Summary

	<u>Cost</u>	<u>Market Value June 30, 1978</u>
Short Term Investments .....	\$ 69,100,673	\$ 69,100,673
Fixed Income Securities .....	1,272,758,188	1,173,569,044
Common Stocks .....	243,865,462	243,596,859
<b>Total Investment Portfolio</b> .....	<b><u>\$1,585,724,323</u></b>	<b><u>\$1,486,266,576</u></b>



# Becker Performance Evaluation

A. G. Becker & Company is the largest and a highly respected portfolio evaluation service in the United States and has evaluated PERA fund's performance since 1969.

A summary of the PERA fund's performance results, along with a brief description of issues to be considered in interpreting the results follow. Since the purpose of the summary is to provide an overview, the reader is cautioned against forming conclusions that may be premature. A number of important details of performance evaluation are not addressed here.

These five exhibits are reprinted from the PERA report; together, they provide a profile of the PERA fund's performance.

**A. Deployment of Assets.** In concise form, this exhibit shows the dollar value of each investment category of the PERA fund at the end of the last fiscal year, as well as the percent of the fund invested in that category. The policy decision to determine the fund's commitment to equities also is addressed here. A greater commitment to equity investments can offer the fund a potentially higher return. The reader should keep in mind, however, that such an investment would be subject to characteristic fluctuations in the equities market.

**B. Total Fund Cumulative Annual Rate of Return.** This exhibit shows how the PERA fund performed over multi-year periods compared with other funds of similar asset size. The boxes on the graph represent the range of performance results earned by all funds in the group. The PERA fund is highlighted by a diamond  $\diamond$ . The longest time period, 1969-1978, is displayed at the left. At the right, the reader can see performance results for last year only. The fund's return is tabulated under the graph, along with a segmentation of the group's results. Percent rank indicates what proportion of the group outperformed the fund; a low percent indicates a relatively higher return. With this exhibit, the reader can choose a time period of

particular interest and examine the return the PERA fund earned for that period. In the past, a market cycle has generally covered a four-year period. For any time period one chooses to examine, the median serves as an effective standard for determining what a "reasonable" return for that period would have been. (The median is that return which outranked 50 percent of the funds in the group and which was outranked by 50 percent of the funds.)

**C. Total Fund Annual Rate of Return.** The main purpose of this exhibit is to show which years have had the greatest impact on the multi-year performance of the PERA fund. Another purpose for displaying returns for individual years is to demonstrate how different securities markets affect fund performance. The variation of the median can be explained, in part, by rising and falling securities markets.

**D. Equities Cumulative Annual Rate of Return and**

**E. Fixed Income Cumulative Annual Rate of Return.** These exhibits show how the equity and debt portions of the PERA fund performed over multi-year periods. Since the fund's total return is comprised of equity and fixed income rates of return, both have been included so that one can see the impact of their return on the entire fund's performance.

This summary should be regarded only as an introduction to evaluating the PERA fund's performance results. Nevertheless, it is hoped that this brief overview will be of some assistance.

**Definitions:** Percent Rank refers to the percent of funds with assets in excess of 50 million dollars evaluated by A. G. Becker which outperformed PERA. The number of funds evaluated as of June 30, 1978, in this category was about 750.

The total number of funds evaluated as of June 30, 1978, by Becker was 3500.

MARKET VALUE OF INVESTMENTS (\$000'S)  
AS OF JUNE 30, 1978

TOTAL FUND  
\$1,489,836

EQUITIES  
\$243,597  
16.4 %

FIXED INCOME  
\$1,242,669  
83.4 %

BONDS  
\$1,012,660  
68.0 %

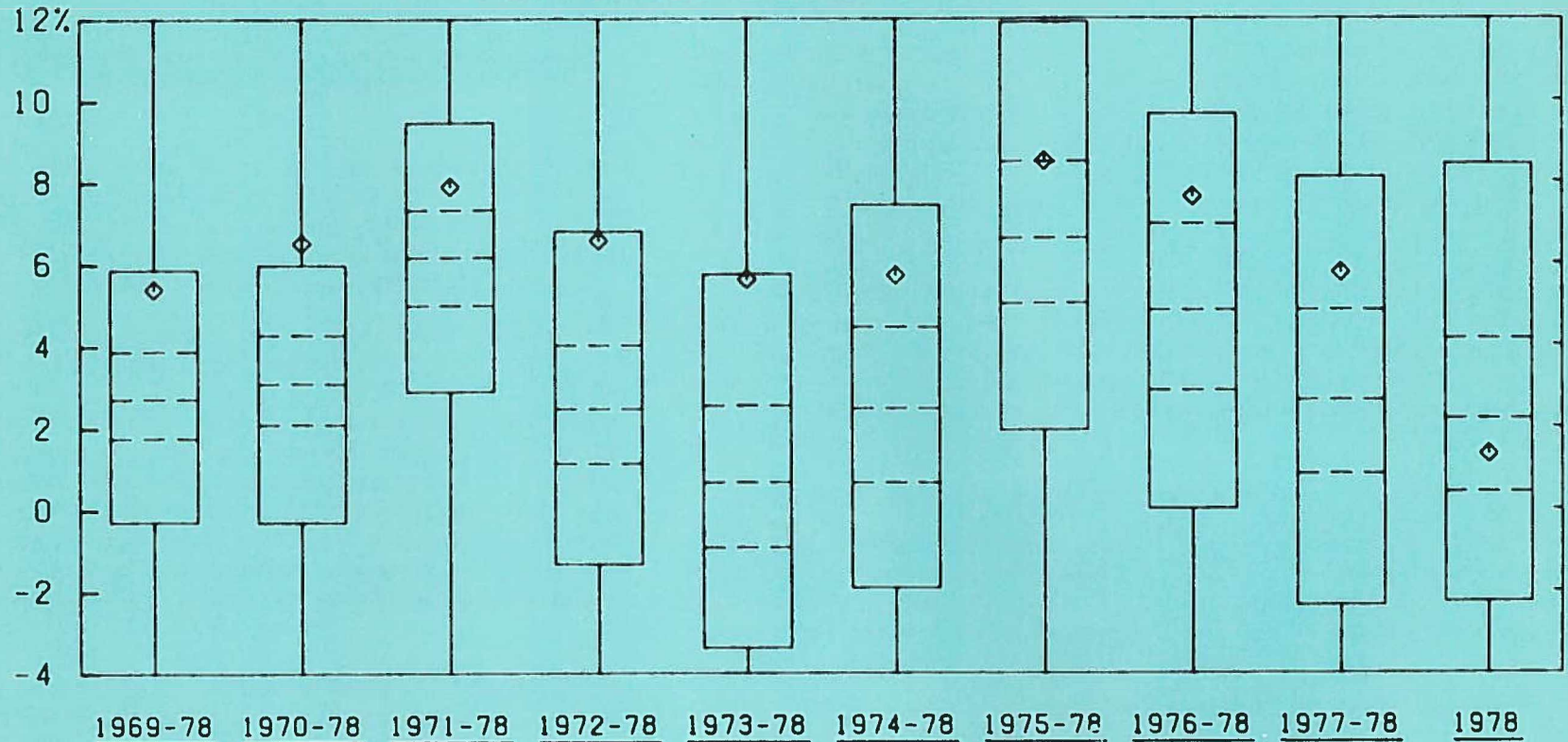
CASH EQUIVALENTS  
\$69,101  
4.6 %

CONVERTIBLES

PRIVATE PLACEMENTS  
\$160,909  
10.8 %

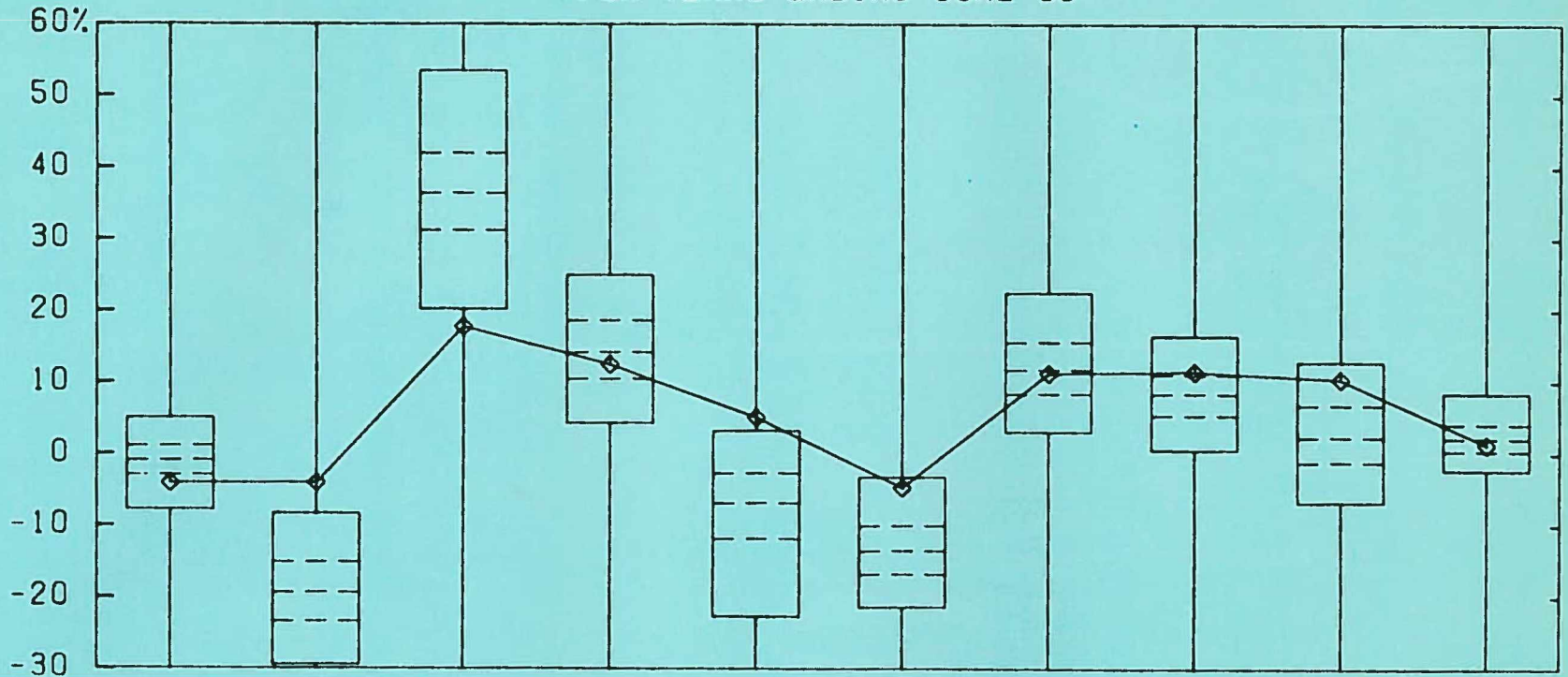


TOTAL FUND: ANNUALIZED RATES OF RETURN  
FOR PERIODS ENDING JUNE 30, 1978



	1969-78	1970-78	1971-78	1972-78	1973-78	1974-78	1975-78	1976-78	1977-78	1978
5TH PERCENTILE	5.9	6.0	9.5	6.8	5.7	7.4	11.9	9.6	8.1	8.4
25TH PERCENTILE	3.9	4.3	7.3	4.0	2.5	4.5	8.5	7.0	4.9	4.2
MEDIAN	2.7	3.1	6.2	2.5	0.7	2.5	6.6	4.9	2.7	2.2
75TH PERCENTILE	1.8	2.1	5.0	1.1	-0.9	0.7	5.0	2.9	0.9	0.4
95TH PERCENTILE	-0.3	-0.3	2.9	-1.3	-3.4	-1.9	1.9	0.0	-2.3	-2.2
YOUR FUND	5.4	6.5	7.9	6.6	5.6	5.7	8.5	7.6	5.8	1.3
PERCENT RANK	8	4	15	6	5	15	25	19	17	63

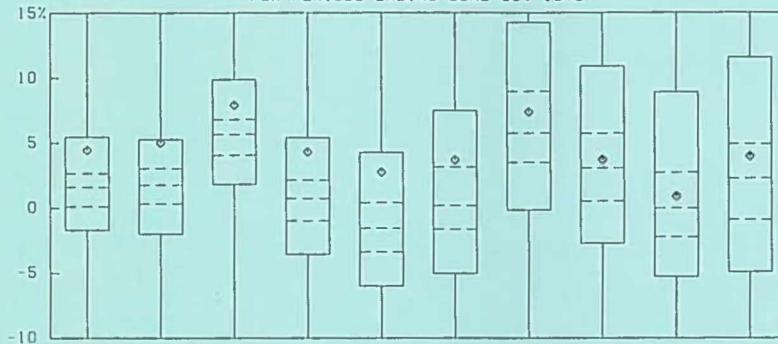
TOTAL FUND: RATES OF RETURN  
FOR YEARS ENDING JUNE 30



	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
5TH PERCENTILE	4.9	-8.3	53.4	25.0	3.3	-3.3	22.5	16.5	12.8	8.4
25TH PERCENTILE	1.1	-15.1	42.0	18.7	-2.7	-10.0	15.6	11.1	6.8	4.2
MEDIAN	-1.0	-19.4	36.4	14.2	-6.8	-13.5	11.7	8.4	2.3	2.2
75TH PERCENTILE	-3.0	-23.4	31.2	10.5	-11.8	-16.8	8.4	5.4	-1.1	0.4
95TH PERCENTILE	-7.8	-29.4	20.2	4.4	-22.7	-21.4	3.1	0.6	-6.7	-2.2
YOUR FUND	-4.1	-4.0	17.8	12.5	5.1	-4.7	11.2	11.5	10.4	1.3
PERCENT RANK	83	2	97	61	2	7	55	23	12	63

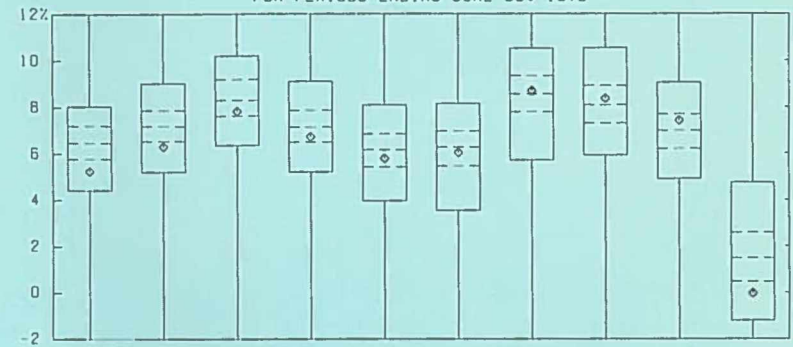


EQUITIES: ANNUALIZED RATES OF RETURN  
FOR PERIODS ENDING JUNE 30, 1978



	1969-78	1970-78	1971-78	1972-78	1973-78	1974-78	1975-78	1976-78	1977-78	1978
5TH PERCENTILE	5.4	5.3	9.9	5.4	4.3	7.5	14.2	10.9	8.9	11.6
25TH PERCENTILE	2.7	3.0	6.8	2.1	0.4	3.1	9.0	5.7	2.7	4.9
MEDIAN	1.6	1.8	5.7	0.7	-1.5	0.2	5.7	3.1	0.0	2.3
75TH PERCENTILE	0.1	0.3	4.1	-1.0	-3.4	-1.6	3.5	0.5	-2.2	-0.9
95TH PERCENTILE	-1.7	-2.0	1.8	-3.5	-6.0	-5.0	-0.2	-2.7	-5.3	-4.9
YOUR FUND	4.4	5.0	7.9	4.3	2.8	3.7	7.4	3.7	0.9	3.9
PERCENT RANK	8	6	14	8	11	22	36	43	40	32

BONDS: ANNUALIZED RATES OF RETURN  
FOR PERIODS ENDING JUNE 30, 1978



	1969-78	1970-78	1971-78	1972-78	1973-78	1974-78	1975-78	1976-78	1977-78	1978
5TH PERCENTILE	8.0	9.0	10.2	9.1	8.1	8.1	10.5	10.5	9.0	4.7
25TH PERCENTILE	7.2	7.9	9.2	7.8	6.8	6.9	9.3	8.9	7.7	2.6
MEDIAN	6.5	7.2	8.3	7.1	6.1	6.3	8.5	8.1	7.0	1.5
75TH PERCENTILE	5.8	6.5	7.6	6.5	5.4	5.5	7.8	7.3	6.2	0.5
95TH PERCENTILE	4.4	5.2	6.3	5.2	4.0	3.5	5.7	5.9	4.9	-1.2
YOUR FUND	5.2	6.3	7.8	6.7	5.8	6.0	8.7	8.4	7.4	0.0
PERCENT RANK	89	78	69	69	65	57	45	42	36	83

# Retirement Statistics

Retirement annuities have been approved by the Retirement Board payable to retired members during the fiscal year as follows:

	<u>State</u>	<u>School</u>	<u>Municipal</u>	<u>Judges</u>
20 or more years service at age 55 (Patrol, Wildlife) . . . . .	1			
30 or more years service at age 55 . . . . .	37	13	1	
20 or more years service at age 60 . . . . .	138	216	10	
5 or more years service at age 65 (Fractional) . . . . .	174	174	26	
General disability . . . . .	188	103	19	3
Termination of service: Retained member (Sec. 9) . . . . .	9	18	2	
Survivor Benefits: Automatic . . . . .	2	2		
Deferred (Age 60 or Age 65) . . . . .	12	25		
20 or more years service at age 55 (reduced) . . . . .	29	45	3	
5 or more years service at age 60 (reduced) . . . . .	113	115	15	1
10 to 16 years—40% reduced . . . . .				1
5 to 10 years—4% . . . . .				1
<b>TOTAL RETIRED DURING FISCAL YEAR . . . . .</b>	<b>703</b>	<b>711</b>	<b>76</b>	<b>6</b>
Total number receiving retirement annuities 6/30/1977 . . . . .	6798	6550	569	56
Total number receiving retirement annuities during fiscal year . . . . .	7501	7261	645	62
Co-Beneficiaries continued upon the death of annuitant . . . . .	65	36	4	5
Returned to rolls from suspension . . . . .		1		
Less: Retired members deceased during fiscal year . . . . .	245	178	21	6
<b>TOTAL NUMBER RECEIVING RETIREMENT ANNUITIES 6/30/1978 . . . . .</b>	<b>7321</b>	<b>7120</b>	<b>628</b>	<b>61</b>
Average monthly rate 6/30/1977 . . . . .	\$ 303	\$ 290	\$ 262	\$ 466
Total paid in annuities 7/1/1977 to 6/30/1978 (12 months) . . . . .	\$24,959,653	\$23,737,819	\$1,821,147	\$322,925
Average monthly rate for annuitants retired during year . . . . .	\$ 412	\$ 383	\$ 301	\$ 557
Survivor Benefits added to rolls during fiscal year . . . . .	46	41	9	2
Total Survivor Benefits 6/30/1978 . . . . .	431	293	78	13
Total paid in Survivor Benefits 7/1/1977 to 6/30/1978 (12 months) . . . . .	\$ 1,226,563	\$ 814,124	\$ 198,960	\$ 75,285
Retirement annuities deferred (Future at 60 or 65) . . . . .	469	729	30	3
Total future liability (annually) . . . . .	\$ 1,395,161	\$ 1,552,204	\$ 68,210	\$ 14,844
Survivor Benefits (Future) . . . . .	34	29	3	1
Total future liability (annually) . . . . .	\$ 71,742	\$ 59,755	\$ 5,440	\$ 7,110



# Annuitant Rolls Increase

The number of persons receiving retirement annuities has grown steadily in relation to active membership, as shown in the table below. Since PERA has not yet reached maturity as a retirement plan, this trend is natural. The trend will continue, and the annuitants on rolls will increase rapidly, until members enrolled near the beginning of the plan reach retirement age and attrition begins among the annuitants, a relatively young group at present.

The level-cost financing principle assures that deduction rates will not

have to be raised to meet the benefit load. The current percentages of pay will be sufficient to meet the increasing annuity payroll, if the benefit provisions contained in state law are not changed.

The steep growth in the dollar amount of the annuitant payroll is shown in the right-hand column of the table.

Figures shown are for the State, School, and Municipal Divisions.

Year	Number of retired members on 6/30	Number of active members on 6/30	Retired members as % of active members on 6/30	Total annuities paid-yr. ending 6/30
1940	93	3,715	2.5%	\$ 72,588
1945	171	5,585	3.1	137,442
1950	280	11,853	2.4	237,866
1955	747	21,185	3.5	745,679
1960	1,775	33,068	5.4	2,055,139
1965	3,631	49,701	7.3	5,486,225
1970	6,308	65,586	9.6	12,366,658
1975	11,650	84,781	13.7	32,242,456
1976	12,788	87,605	14.6	37,837,649
1977	13,917	89,604	15.5	43,631,214
1978	15,069	91,892	16.4	50,518,619

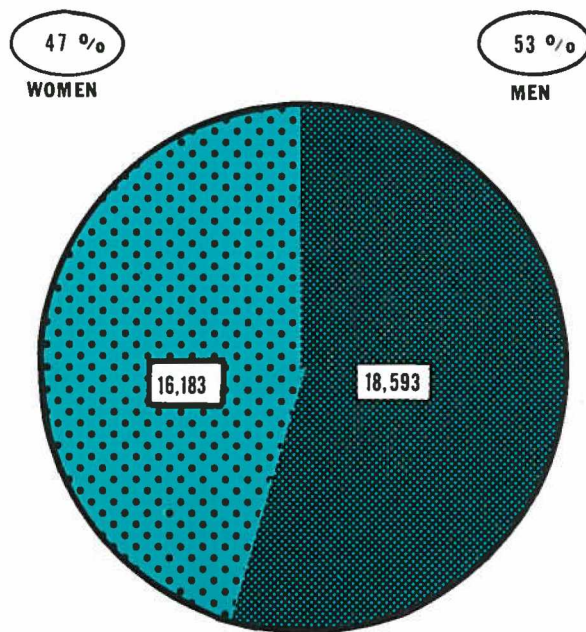
## Membership Statistics

	CONSOLIDATED TOTALS	STATE DIVISION	SCHOOL DIVISION	MUNICIPAL DIVISION	JUDGES' DIVISION
<b>TOTAL MEMBERSHIP MAY 31, 1978</b>	<b>108,304</b>	<b>43,820</b>	<b>58,224</b>	<b>5,947</b>	<b>313</b>
Active Members	92,388	36,094	50,809	5,246	239
Annuitants and Survivor Benefit Members	15,916	7,726	7,415	701	74
New Members Accepted					
June 1, 1977, to May 31, 1978	15,758	6,170	8,388	1,186	14
Active Members Deceased	69	25	36	7	1
Active Members Accounts Withdrawn	11,212	4,486	5,993	731	2

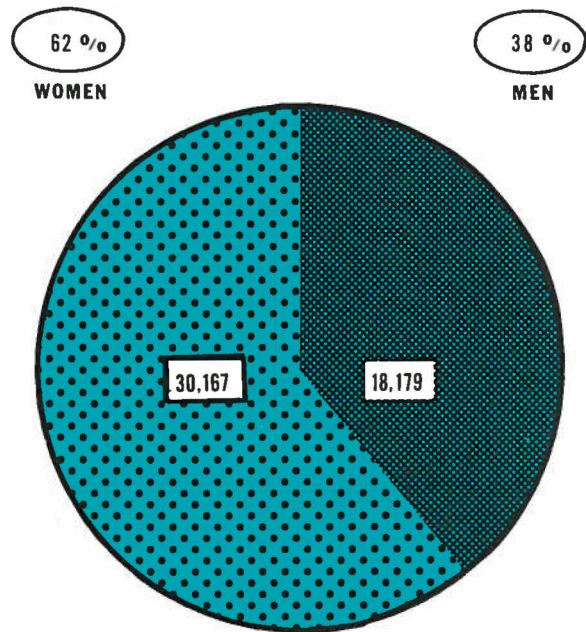
# NUMBERS OF ACTIVE MEMBERS BY DIVISION 12-31-77

*(Further Distribution According to Sex)*

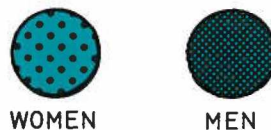
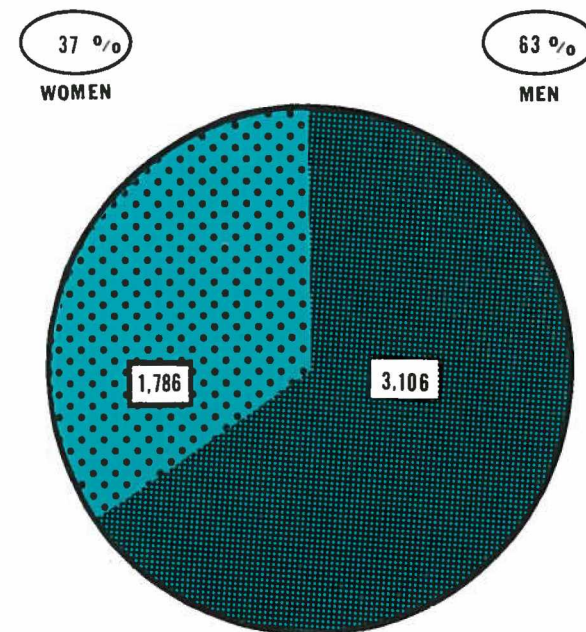
## State Division



## School Division



## Municipal Division



## Judges Division

93% Men - 213  
7% Women - 16



# State Division

## Active Members in Valuation By Attained Age Groups & Years of Credited Service—12-31-77

Active members included in the STATE DIVISION valuation totaled 34,776, involving monthly salaries totaling \$42,157,322 (\$505,887,864 annually).

Attained Age Groups	Number With Indicated Years of Credited Service							Totals	Monthly Salaries
	0-4	5-9	10-14	15-19	20-24	25-29	30 & Up		
Under 20	155							155	\$ 82,319
20-24	2,201	84						2,285	1,662,869
25-29	4,429	871	22					5,322	5,016,018
30-34	3,531	1,690	373	27				5,621	6,486,884
35-39	1,874	1,477	806	225	4			4,386	5,789,474
40-44	1,415	982	786	423	119	2		3,727	5,084,533
45-49	1,145	1,014	819	429	298	60	9	3,774	5,202,023
50-54	869	950	851	504	335	206	61	3,776	5,206,522
55-59	579	829	825	489	345	195	91	3,353	4,510,003
60	88	133	128	105	64	45	22	585	780,006
61	66	115	117	72	68	24	18	480	621,632
62	40	96	106	100	34	29	18	423	545,688
63	29	69	106	60	35	16	22	337	446,730
64	29	69	85	73	25	10	14	305	396,520
65	5	46	63	31	19	11	6	181	234,360
66	6	12	3	1	1	1		24	36,682
67	5	11	3	2	1		2	24	33,180
68		1	2	1	1			5	5,687
69	3	4	1					8	9,194
70 & Over		3	1	1				5	6,998
<b>Totals</b>	<b>16,469</b>	<b>8,456</b>	<b>5,097</b>	<b>2,543</b>	<b>1,349</b>	<b>599</b>	<b>263</b>	<b>34,776</b>	<b>\$42,157,322</b>

The median attained age for State Division members was 39.6 years, and the median service was 5.5 years. This assumes even distribution throughout the median interval.

# School Division

## Active Members in Valuation By Attained Age Groups & Years of Credited Service—12-31-77

Active members included in the SCHOOL DIVISION valuation totaled 48,346, involving monthly salaries totaling \$47,473,497 (\$569,681,964 annually).

Attained Age Groups	Number With Indicated Years of Credited Service							Totals	Monthly Salaries
	0-4	5-9	10-14	15-19	20-24	25-29	30 & Up		
Under 20	143							143	\$ 65,381
20-24	2,451	37						2,488	1,674,032
25-29	6,762	1,312	3					8,077	7,083,359
30-34	4,864	3,330	496	1				8,691	8,665,313
35-39	3,300	2,102	1,439	261				7,102	7,327,995
40-44	2,507	1,650	1,069	934	107			6,267	6,515,752
45-49	1,677	1,528	962	784	424	42	1	5,418	5,742,718
50-54	1,085	1,039	912	581	472	214	9	4,312	4,611,192
55-59	750	758	695	586	415	195	34	3,433	3,452,502
60	121	139	95	129	69	22	8	583	562,877
61	103	85	71	93	50	13	11	426	412,643
62	68	92	94	81	51	21	7	414	414,742
63	51	94	68	68	37	27	10	355	345,267
64	40	67	61	69	42	18	8	305	311,021
65	26	46	49	42	37	12	5	217	211,513
66	10	5	7	2	2			26	19,995
67	8	8	3	5	1			25	14,865
68	4	3	5	5	3			20	14,216
69	6	5	1	3				15	8,316
70 & Over	7	10	6	1	4	1		29	19,798
<b>Totals</b>	<b>23,983</b>	<b>12,310</b>	<b>6,036</b>	<b>3,645</b>	<b>1,714</b>	<b>565</b>	<b>93</b>	<b>48,346</b>	<b>\$47,473,497</b>

The median attained age for School Division members was 38.4 years, and the median service was 5.1 years. This assumes even distribution throughout the median interval.



# Municipal Division

## Active Members in Valuation By Attained Age Groups & Years of Credited Service—12-31-77

Active members included in the MUNICIPAL DIVISION valuation totaled 4,892, involving monthly salaries totaling \$4,981,675 (\$59,780,100 annually).

Attained Age Groups	Number With Indicated Years of Credited Service							Totals	Monthly Salaries
	0-4	5-9	10-14	15-19	20-24	25-29	30 & Up		
Under 20	37							37	\$ 19,042
20-24	437	31						468	348,365
25-29	746	239	4					989	908,744
30-34	501	270	61	2				834	881,191
35-39	306	149	95	23				573	620,631
40-44	193	123	85	37	22	1		461	515,337
45-49	167	166	71	31	22	11		468	510,665
50-54	115	117	63	36	30	17	6	384	425,532
55-59	86	115	89	43	34	23	8	398	452,085
60	13	19	6	6	9		5	58	61,339
61	8	12	14	5	3	3		45	45,734
62	5	17	12	8	3	1	1	47	51,882
63	8	8	5	4	2	1		28	30,120
64	7	7	14	7	5	2	1	43	47,707
65	5	9	7	5	2	2		30	31,274
66	3	5	3	1		2		14	18,543
67		2	1		1	1		5	3,363
68			2					2	1,858
69		1	1					2	2,369
70 & Over	1	2	2	1				6	5,894
<b>Totals</b>	<b>2,638</b>	<b>1,292</b>	<b>535</b>	<b>209</b>	<b>133</b>	<b>64</b>	<b>21</b>	<b>4,892</b>	<b>\$4,981,675</b>

The median attained age for Municipal Division members was 36.0 years, and the median service was 4.6 years. This assumes even distribution throughout the median interval.

# Judges' Division

## Active Members in Valuation By Attained Age Groups & Years of Credited Service—12-31-77

Active members included in the JUDGES' DIVISION valuation totaled 229, involving monthly salaries totaling \$517,090 (\$6,205,080 annually).

Attained Age Groups	Number With Indicated Years of Credited Service							Totals	Monthly Salaries
	0-4	5-9	10-14	15-19	20-24	25-29	30 & Up		
25-29	2	1						3	\$ 2,813
30-34	9	1						10	16,213
35-39	16	6						22	50,425
40-44	14	10	2	1				27	56,807
45-49	8	9	8	1				26	64,158
50-54	10	12	15	2				39	92,167
55-59	6	13	14	6				39	89,665
60		1	1	3		1		6	13,173
61	2		3					5	12,920
62	2	2	2		1			7	16,125
63		4	4		1			9	22,583
64		3	3	2	1			9	17,896
65		1		2	1			4	10,167
66	1		1	1				3	7,750
67	2	2	3					7	12,270
68			2	1				3	7,750
69		1	1		1			3	8,250
70 & Over		4	2				1	7	15,958
<b>Totals</b>	<b>72</b>	<b>70</b>	<b>61</b>	<b>19</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>229</b>	<b>\$517,090</b>

The median attained age for Judges Division members was 53.4 years, and the median service was 8.0 years. This assumes even distribution throughout the median interval.



# Per Capita Reserves

## Fiscal Years 1975-1978

		Present Retired Reserve	Members' Deposits	Future Retired Reserve
STATE DIVISION	June 30, 1975 .....	\$33,502 .....	\$ 3,800 .....	\$ 2,219
	June 30, 1976 .....	35,930 .....	4,300 .....	2,932
	June 30, 1977 .....	38,614 .....	4,875 .....	3,735
	June 30, 1978 .....	41,986 .....	5,382 .....	4,480
SCHOOL DIVISION	June 30, 1975 .....	\$32,333 .....	\$ 3,349 .....	4,088
	June 30, 1976 .....	34,508 .....	3,717 .....	6,856
	June 30, 1977 .....	36,442 .....	4,190 .....	6,000
	June 30, 1978 .....	39,231 .....	4,627 .....	7,131
MUNICIPAL DIVISION	June 30, 1975 .....	\$29,920 .....	\$ 2,537 .....	\$ 2,585
	June 30, 1976 .....	32,236 .....	3,136 .....	3,446
	June 30, 1977 .....	33,941 .....	3,591 .....	4,328
	June 30, 1978 .....	36,396 .....	3,798 .....	4,873
JUDGES' DIVISION	June 30, 1975 .....	\$48,125 .....	\$ 7,978 .....	\$12,075
	June 30, 1976 .....	51,573 .....	8,612 .....	13,320
	June 30, 1977 .....	57,561 .....	9,625 .....	15,155
	June 30, 1978 .....	61,032 .....	10,640 .....	16,310

The table above shows some important facts about the three main reserves in the PERA financial structure—reserves for presently retired, members' deposits, and the reserves for future retirees.

Using the State Division as an example on 6-30-78, if you divide the reserve established for those already receiving retirement annuities by the total number of those recipients, you end up with \$41,986 per retiree. If you divide the total individual deposits by the total active membership, the result is \$5,382 per active member. The reserve for future retired is used with active members' own deposits to finance the retirement of each retiring member. This reserve divided by the number of active members nets \$4,480 per member.

PERA annuities are fully funded. This means that once a member retires, there is enough money set aside to pay his annuity for the rest of his life without additional member or employer deductions. The Present Retired Reserve is the largest of the three on a per capita basis. Its growth in each division from year to year indicates the higher retirement amounts being paid.

The member's personal deposits are only used for the member's own benefit or his survivor's benefit.

The Future Retired Reserve is a pooled fund containing employer deductions and interest within each division. It helps fund benefits earned by active members during their careers. When an individual is granted a benefit at retirement, which is determined according to the provisions of State Law, a portion of the Future Retired Reserve is combined with the member's deposits and placed in the Present Retired Reserve to pay his benefit.

While PERA retirees' benefits are fully funded, benefits that have been earned but are not yet payable to actively-employed members are not presently fully funded. This means that assets in Members' Deposits and the Future Retired Reserve total less than the liabilities for service active members have already rendered. This shortfall is called the unfunded accrued liability. State Law requires, and PERA is following, a schedule to amortize the unfunded liability over a period not exceeding 60 years.

# Actuarial Principles

**Promises Made, and Eventually Paid.** As each year is completed, PERA in effect hands an "IOU" to each member then acquiring a year of service credit—the "IOU" says: "The Public Employees' Retirement Association of Colorado owes you one year's worth of retirement benefits, payments in cash commencing when you qualify for retirement."

The related key financial questions are:

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

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

Or the future taxpayers, who happen to be in Colorado at the time the IOU becomes a cash demand?

The law governing PERA financing intends that this year's taxpayers contribute the money to cover the IOUs being handed out this year. By following this principle, **the employer contribution rate will remain approximately level from generation to generation**—our children and our grandchildren will contribute the same percents of active payroll we contribute now.

(There are systems which have a design for deferring contributions to future taxpayers, lured by a lower contribution rate now and putting aside the consequence that the contribution rate must then relentlessly grow much greater over decades of time—consume now, and let your children face your financial pollution after you retire.) See chart on next page.

An inevitable by-product of the level-cost design is the accumulation of reserve assets, for decades, and the income produced when the assets are invested. Invested assets are a by-product and not the objective. Investment income becomes in effect the third contributor for benefits to employees, and is directly related to the contribution amounts required from employees and employers.

Translated to actuarial terminology, this level-cost objective means that

the contribution rates must total at least the following:

Current cost (the cost of members' service being rendered this year).  
... plus ...

Interest on unfunded accrued liabilities (unfunded accrued liabilities are the difference between: liabilities for members' service already rendered; and the accrued assets of PERA).

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

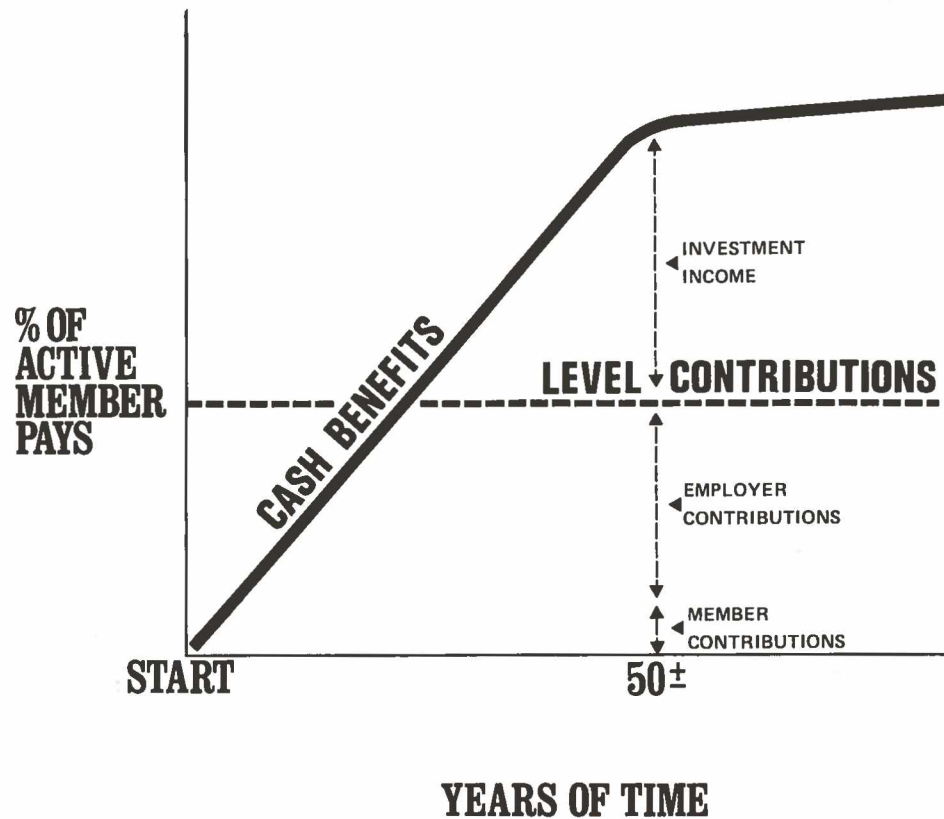
An actuarial valuation has a number of ingredients such as: the rate of investment income which plan assets will earn; the rates of withdrawal of active members who leave covered employment before qualifying for any monthly benefit; the rates of mortality; the rates of disability; the rates of salary increases; and the assumed age or ages at actual retirement.

In making an actuarial valuation assumptions must be made as to what the above rates will be for the next year and for decades in the future. Only the subsequent actual experience of the plan can indicate the degree of accuracy of the assumptions.

**Reconciling Differences Between Assumed Experience and Actual Experience.** Once actual experience has occurred and been observed, it will not coincide exactly with assumed experience, regardless of the wisdom of the assumptions or the skill of the actuary and the millions of calculations he made. The future can be predicted with considerable precision, except inflation, but not 100 percent precision.

PERA copes with these continually changing differences by having annual actuarial valuations. Each actuarial valuation is a complete recalculation of assumed future experience, taking into account all past differences between assumed and actual experience. The result is **continuing adjustments in financial position.**





**Cash Benefits Line.** This relentlessly increasing line is the fundamental reality of retirement plan financing. As the ratio of retired to active, working members rises, the benefits paid rise as a percent of payroll.

The line increases over time even if new benefits aren't added. It increases regardless of the financing method being followed.

**Level Contribution Line.** Determining the level contribution line requires detailed assumptions concerning experiences in future decades, including:

- Rate of withdrawal of active members (turnover);
- Rates of mortality;
- Rates of disability;
- Ages at actual retirement;
- Rates of pay increase;
- Investment income;
- Change in active member group size.

# Assumptions Used By Actuary

(For State, School, and Municipal Divisions Only)

1. **The interest rate** used in making the valuation was six percent per annum, compounded annually.

2. **The mortality table**, for post-retirement mortality, used in evaluating annuities to be paid, was the 1960 Group Annuity Mortality Table, set back no years for men and set back five years for women as shown below.

## Single Life Retirement Values

Based on 1960 Group Annuity Mortality & 6% Interest

Sample Attained Ages	Present Value of \$1.00 Monthly for Life		Present Value of \$1.00 Mo. the First Year Increasing \$.03 Yearly		Future Life Expectancy (Years)	
	Men	Women	Men	Women	Men	Women
40	\$172.11	\$179.59	\$229.21	\$243.31	35.48	40.21
45	162.79	172.11	212.69	229.21	30.85	35.48
50	151.92	162.79	194.33	212.69	26.44	30.85
55	139.60	151.92	174.49	194.33	22.30	26.44
60	125.60	139.60	153.11	174.49	18.43	22.30
65	109.70	125.60	130.23	153.11	14.80	18.43
70	92.95	109.70	107.39	130.23	11.58	14.80
75	75.97	92.95	85.47	107.39	8.79	11.58
80	60.20	75.97	66.11	85.47	6.54	8.79
85	47.51	60.20	51.11	66.11	4.98	6.54

3. **The salary scale**, showing present salary assumed to result in a salary of \$1,000 at age 60.

Sample Ages	Present Salary Resulting in Salary of \$1,000 at Age 60		
20	\$ 138	40	\$ 435
25	191	45	557
30	255	50	694
35	336	55	843
		60	1,000



**4. The probabilities of age and service retirement** for members eligible to retire. Eligibility for superannuation retirement was assumed to be age 55 and 30 years of service, age 60 with 20 or more years of service, or age 65 with 5 or more years of service. (Assumed eligibility for Highway Patrol members and Game, Fish & Parks members in the State Division was age 55 and 20 years of service or age 65 and 5 or more years of service.)

**Percent of Eligible Active Members  
Retiring Within Next Year—By Division**

Retirement Ages	State	School	Municipal
55.....	10%	15%	10%
56.....	10	15	10
57.....	10	15	10
58.....	10	15	10
59.....	10	15	10
60.....	10	15	10
61.....	10	15	10
62.....	10	15	10
63.....	10	15	10
64.....	15	25	15
65.....	80	60	40
66.....	30	30	30
67.....	40	40	40
68.....	50	50	50
69.....	90	60	90
70.....	100	100	100

**5. The probabilities of separating from service** due to death or withdrawal. In the State and Municipal Divisions, vesting was assumed to occur after age 40 with 10 or more years of accrued service. For the State Division it was assumed that 50 percent of vested annuities, and for the Municipal Division 20 percent of vested annuities, will be forfeited by the withdrawal of member deductions.

For School Division members vesting was assumed to occur after completion of 10 years of accrued service and that 10 percent of vested annuities will be forfeited by the withdrawal of member deductions.

**Percent of Active Participants Separating Within Next Year**

Sample	State		School		Municipal	
	Men	Women	Men	Women	Men	Women
20	31.31%	38.33%	30.63%	39.07%	31.31%	38.33%
25	16.53	34.10	16.11	30.81	16.53	34.10
30	12.10	21.04	11.83	22.75	12.10	21.04
35	8.48	11.27	8.58	14.31	8.48	11.27
40	6.46	7.76	6.00	10.65	6.46	7.76
45	4.18	5.86	5.14	6.86	4.18	5.86
50	4.48	4.85	4.52	5.56	4.48	4.85
55	4.04	3.78	4.17	4.25	4.04	3.78
60	3.98	3.83	3.94	3.55	3.98	3.83

6. The entry age normal cost method of valuation was used in determining superannuation annuity liabilities and normal cost.

7. In financing unfunded accrued liabilities, active member payroll was assumed to increase three percent a year.

## Actuarial Assumptions for Judges Division

1. The interest rate used in making the valuation was six percent per annum, compounded annually.

2. The mortality table, for post-retirement mortality, used in evaluating annuities to be paid, was the 1960 Group Annuity Mortality Table, set back no years for men and set back five years for women.

**Single Life Retirement Values  
Based on 1960 Group Annuity Mortality & 6% Interest**

Sample Attained Ages	Present Value \$1.00 Monthly for Life		Present Value of \$1.00 Mo. the First Year Increasing \$.015 Yearly		Future Life Expectancy (Years)	
	Men	Women	Men	Women	Men	Women
40	\$172.11	\$179.59	\$200.66	\$211.45	35.48	40.21
45	162.79	172.11	187.74	200.66	30.85	35.48
50	151.92	162.79	173.13	187.74	26.44	30.85
55	139.60	151.92	157.05	173.13	22.30	26.44
60	125.60	139.60	139.35	157.05	18.43	22.30
65	109.70	125.60	119.97	139.35	14.80	18.43
70	92.95	109.70	100.17	119.97	11.58	14.80
75	75.97	92.95	80.72	100.17	8.79	11.58
80	60.20	75.97	63.16	70.72	6.54	8.79
85	47.51	60.20	49.31	63.16	4.98	6.54



**3. The salary scale, showing present salary assumed to result in a salary of \$1,000 at age 65.**

Sample Ages	Present Salary Resulting in Salary of \$1,000 at Age 65		
25	\$ 164	45	479
30	220	50	597
35	289	55	725
40	375	60	861
		65	1,000

**4. The probabilities of age and service retirement for members eligible to retire. Eligibility for superannuation retirement was assumed to be age 65 with 10 or more years of service.**

Retirement Ages	Percent of Eligible Active Members Retiring Within Next Year		
65	40%	68	15
66	20	69	25
67	15	70	100

**5. The probabilities of separating from service due to death or withdrawal. Vesting was assumed to occur after completion of 10 years of accrued service.**

Sample Ages	Percent of Active Members Separating Within the Next Year	
	Men	Women
25	7.79%	7.78%
30	7.31	7.29
35	6.40	6.36
40	5.33	5.27
45	4.29	4.15
50	3.14	2.88
55	1.87	1.52
60	1.48	1.02
65	2.18	1.39

**6. The attained age normal cost method of valuation was used in determining superannuation annuity liabilities and normal cost.**

**7. In financing unfunded accrued liabilities, active member payroll was assumed to increase three percent a year.**

# Computed Employer Contribution Rate

Expressed as Percents of Active Member Payroll

	State	School	Municipal	Judges
Contributions for Current Cost:				
Superannuation annuities	9.73%	11.03%	9.59%	15.11%
Disability annuities	1.05	0.85	1.20	0.50
Survivor annuities	<u>0.60</u>	<u>0.60</u>	<u>0.80</u>	<u>1.50</u>
Total	11.38	12.48	11.59	17.11
Member current contributions	7.77	7.75	7.75	7.00
(Future refunds)	(3.48)	(3.28)	(3.37)	(0.81)
Available for annuities	<u>4.29</u>	<u>4.47</u>	<u>4.38</u>	<u>6.19</u>
Employer Current Cost	7.09	8.01	7.21	10.92
Unfunded Accrued Liabilities	3.56	4.09	2.65	1.08
(Amortization period)	(39 years)	(27 years)	(27 years)	(58 years)
<b>TOTAL COMPUTED EMPLOYER CONTRIBUTION RATE</b>	<b>10.65%</b>	<b>12.10%</b>	<b>9.86%</b>	<b>12.00%</b>
<b>STATUTORY RATE</b>	<b>10.65%</b>	<b>12.10%</b>	<b>9.86%</b>	<b>12.00%</b>

Dec. 31, 1977



# Glossary

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**Actuarial Reserve.** A fund for the purpose of paying benefits which will not be paid in the very near future but which have already been earned. An actuarial reserve retirement system sets aside money for benefits earned before the benefits will actually have to be paid.

**Actuarial Valuation.** An examination by an actuary of a group of people, with regard to certain characteristics of the people in that group. Some of the characteristics are age, service, salaries, rate of turnover by death or termination. The actuary can then determine whether contributions are sufficient to fund liabilities earned. An annual valuation of PERA members and annuitants is conducted by PERA's actuary.

**Amortize.** To pay off through regular contributions or adjustments over a specified period.

**Annuity.** A series of regular payments to the annuitant for life.

**Audit.** An examination by someone or some firm outside an organization of accounting records developed by the staff of the organization. Recommendations and suggestions for better record-keeping and management are often part of an audit.

**Corporate Obligation.** An investment in a corporation with specified payments of principal and interest over a definite period of time.

**Current Cost.** The cost of members' service being rendered this year, expressed as a percentage of payroll. Current cost is a part of the total contribution rate.

**Diversification.** The practice of investing in several different business industries and companies within the industries in order to minimize total portfolio risks.

**Level-Cost Financing.** A method of financing a retirement system in which contributions, as a percentage of payroll, remain level from generation to generation, if benefit provisions are not changed.

**Portfolio.** The total of investments held, (by PERA, for example).

**Risk.** The possibility that the expected rate of return may not be attained for the total portfolio or for specific securities.

**Temporary Investment.** An investment in highly liquid money market instruments usually maturing within one year.

**Total Rate of Return.** Cash income plus capital appreciation, less capital depreciation, realized and unrealized, adjusted for capital contributions and withdrawals expressed as a percentage on an annual basis.

**Unfunded Accrued Liability.** The difference between liabilities for members' service already rendered, and the assets of the system, measured as of any particular date.

