

City of Royal Oak Retirement System

49th Annual Actuarial Valuation
June 30, 1997

Gabriel, Roeder, Smith & Company



GABRIEL, ROEDER, SMITH & COMPANY

Consultants & Actuaries

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April 28 1997

The Board of Trustees
City of Royal Oak Retirement System
Royal Oak, Michigan

Dear Board Members:

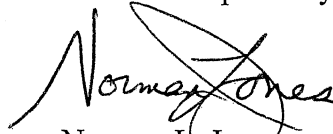
The results of the *49th Annual Actuarial Valuation* of the City of Royal Oak Retirement System are presented in this report. The purpose of the valuation was to measure the system's funding progress and to determine the employer contribution rate for the ensuing fiscal year.

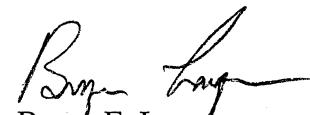
The valuation was based upon information, furnished by the City, concerning Retirement System benefits, financial transactions, and individual active, terminated and retired members and beneficiaries. Data was checked for internal and year to year consistency but was not otherwise audited by us.

The date of the valuation was *June 30, 1997*.

To the best of our knowledge, this report is complete and accurate and was made in accordance with standards of practice prescribed by the Actuarial Standards Board. We believe that in the aggregate, actuarial assumptions used for the valuation produce results which are reasonable.

Respectfully submitted,


Norman L. Jones


Bryan E. Langer

NLJ/mjd

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Section A

Valuation Results

FUNDING OBJECTIVE

The funding objective of the Retirement System is to establish and receive contributions, expressed as percents of active member payroll, which will remain approximately level from year to year and will not have to be increased for future generations of citizens.

CONTRIBUTION RATES

The Retirement System is supported by member contributions, City contributions and investment income from Retirement System assets.

Contributions which satisfy the funding objective are determined by the annual actuarial valuation and are sufficient to:

- (1) Cover the actuarial present value of benefits allocated to the current year by the actuarial cost method described in Section C (the normal cost); and
- (2) Finance over a reasonable period of future years the actuarial present value of benefits not covered by valuation assets and anticipated future normal costs (the unfunded actuarial accrued liability).

Computed contribution rates for the fiscal year beginning July 1, 1998 are shown on page A-2.

The City's established contribution rate of 0.53% is sufficient to finance the employer normal cost and to amortize the assets in excess of the actuarial accrued liability (\$18,694,904 as of the June 30, 1997 valuation) as a level percent of payroll over a period of 10 years.

CONTRIBUTIONS TO PROVIDE BENEFITS
FISCAL YEAR BEGINNING JULY 1, 1998

| Contributions for | % of Covered Payroll | | |
|---|----------------------|----------------------------------|------------------|
| | General and Water | Police Officers And Firefighters | Weighted Average |
| Normal cost of benefits: | | | |
| Age & service | 12.39% | 15.24% | 13.75% |
| Disability | 2.17 | 3.23 | 2.68 |
| Death before retirement | 0.76 | 0.71 | 0.74 |
| Deferred service pensions | 0.98 | 0.69 | 0.84 |
| Future refunds of member contributions | 0.23 | 0.20 | 0.22 |
| Post-retirement lump sum death benefits | 0.02 | 0.01 | 0.02 |
| Total | 16.55 | 20.08 | 18.25 |
| Member contributions | 3.98 | 4.90 | 4.42 |
| Employer normal cost | 12.57 | 15.18 | 13.83 |
| Unfunded actuarial accrued liability | 0.00 | 0.00 | 0.00 |
| Full funding credit* | (11.97) | (14.76) | (13.30) |
| COMPUTED EMPLOYER RATE | 0.60% | 0.42% | 0.53% |

* As of June 30, 1997, the assets available to finance retirement allowances exceeded the actuarial accrued liability. Amortization of the excess over a 10 year period results in the full funding credit shown.

Determining Employer Dollar Contributions

For any period of time, the percent-of-payroll contribution rate should be converted to dollars -- and then contributed to the Retirement System.

Recommended Procedure: (1) at the end of each payroll period, multiply the active member payroll for the period by the employer contribution percent; and (2) promptly contribute the dollar amount so determined.

The total active member payroll reported to us for this valuation was \$15,949,326. Applying the weighted average employer contribution rate of 0.53% to this payroll produces annual employer contributions of \$84,531 -- \$49,919 for General and Water and \$34,612 for Police and Fire.

Actual employer contributions for the last fiscal year were reported to be \$1,399,698.

In financing the actuarial accrued liabilities, the present smoothed funding value of assets of \$124,491,092 was distributed as follows:

| Reserves for | Present Assets Applied to | | | Totals |
|--------------------------|--|--------------------------------|--------------------------------|-------------------|
| | Member Actuarial Accrued Liabilities* | Retired Life Liabilities | Health Insurance Reserve | |
| Employees' Contributions | | | | |
| General Members | \$ 2,621,804 | \$ | \$ | \$ 2,621,804 |
| Police & Fire Members | <u>4,821,962</u> | | | <u>4,821,962</u> |
| Totals | 7,443,766 | | | 7,443,766 |
| Employer Contributions | | | | |
| General Members | 27,268,443 | 1,904,197 | | |
| Police & Fire Members | <u>26,651,636</u> | <u>1,499,536</u> | | |
| Totals | 53,920,079 | 3,403,733 | 8,173,809 | 65,497,621 |
| Retired Benefit Payments | | <u>51,549,705</u> | | <u>51,549,705</u> |
| Totals | \$61,363,845 | \$54,953,438 | \$8,173,809 | \$124,491,092 |

Assets were applied against actuarial accrued liabilities in determining unfunded actuarial accrued liabilities as follows:

| | Retired Lives | Active Members* | Totals |
|--|-------------------|--------------------|--------------------|
| Computed Actuarial Accrued Liabilities | \$54,953,438 | \$42,668,941 | \$ 97,622,379 |
| Applied Assets | <u>54,953,438</u> | <u>61,363,845</u> | <u>116,317,283</u> |
| Unfunded Actuarial Accrued Liabilities/ (Full Funding Credit) | \$ 0 | \$(18,694,904) | \$(18,694,904) |

* Includes inactive members eligible for deferred allowances.

DERIVATION OF EXPERIENCE GAIN (LOSS)
YEAR ENDED JUNE 30, 1997

Actual experience will never (except by coincidence) coincide exactly with assumed experience. It is hoped that gains and losses will cancel each other over a period of years, but sizable year to year fluctuations are common. Detail on the derivation of this year's experience gain (loss) is shown below.

| | <u>\$1,000s</u> |
|--|-----------------|
| (1) UAAL* at start of year | \$ (10,842) |
| (2) Normal cost from last valuation | 2,739 |
| (3) Actual member and employer contributions | 1,617 |
| (4) Interest accrual: $(1) \times .0775 + [(2) - (3)] \times .03875$ | (797) |
| (5) Expected UAAL before changes: $(1) + (2) - (3) + (4)$ | (10,517) |
| (6) Change from benefit improvements | 0 |
| (7) Change from revised valuation procedures | 0 |
| (8) Expected UAAL after changes: $(5) + (6) + (7)$ | (10,517) |
| (9) Actual UAAL at end of year | (18,695) |
| (10) Gain (loss): $(8) - (9)$ | 8,178 |
| (11) Gain (loss) as percent of actuarial accrued liabilities at start of year (\$94,730) | 8.6% |

* *Unfunded actuarial accrued liability.*

Primary sources of favorable experience during the past year were greater than assumed investment income and less than assumed retirements. The 1996-1997 recognized return based on the funding value of assets was 14.6% compared to an assumed rate of 7.75%.

| Valuation Date | Experience Gain (Loss) As % of Beginning of Year Accrued Liability |
|-------------------|--|
| 5-31-91 | 0.8% |
| 5-31-92 | 0.6 |
| 6-30-93 | 4.7 |
| 6-30-94 | 1.9 |
| 6-30-95 | 7.1 |
| 6-30-96 | 6.4 |
| 6-30-97 | 8.6 |

SUMMARY STATEMENT OF SYSTEM RESOURCES AND OBLIGATIONS

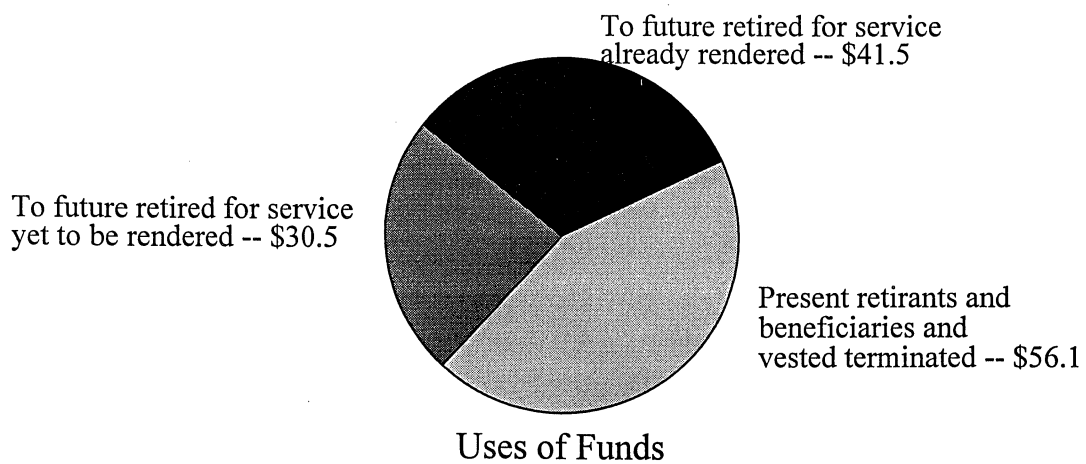
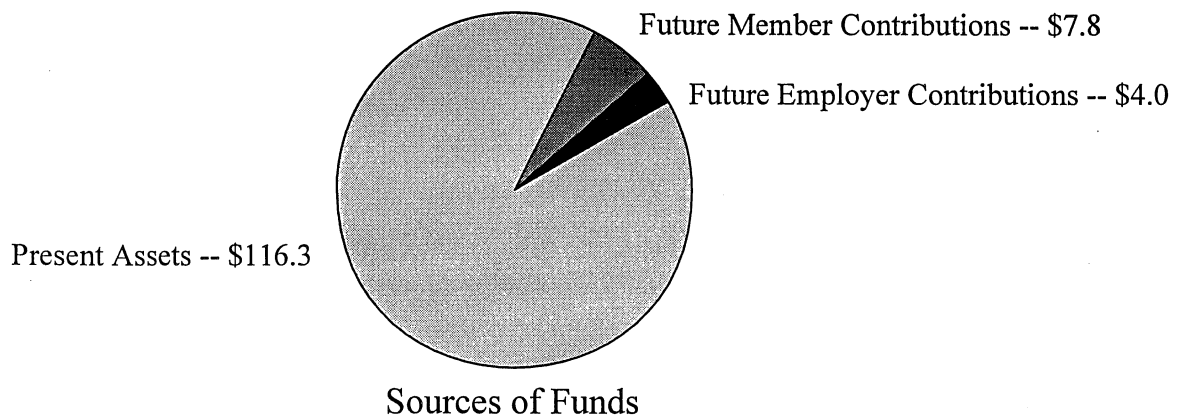
Present Resources and Expected Future Resources

| | |
|--|----------------------|
| A. Present valuation assets | |
| 1. Net assets from system financial statements | \$145,072,454 |
| 2. Market value adjustment | <u>(28,755,171)</u> |
| 3. Valuation assets | 116,317,283 |
| B. Actuarial present value of expected future employer contributions | |
| 1. For normal costs | 22,736,128 |
| 2. For unfunded actuarial accrued liability | <u>(18,694,904)</u> |
| 3. Total | 4,041,224 |
| C. Actuarial present value of expected future member contributions | 7,759,407 |
| D. Health Insurance Reserve | <u>8,173,809</u> |
| E. Total Present and Expected Future Resources | \$136,291,723 |

Actuarial Present Value of Expected Future Benefit Payments

| | |
|--|----------------------|
| A. To retirants and beneficiaries | |
| 1. Annual pensions | \$ 54,953,438 |
| 2. Reserve | <u>0</u> |
| 3. Total | 54,953,438 |
| B. To vested terminated members | 1,167,969 |
| C. To present active members | |
| 1. Allocated to service rendered prior to valuation date - actuarial accrued liability | 41,500,972 |
| 2. Allocated to service likely to be rendered after valuation date | <u>30,495,535</u> |
| 3. Total | 71,996,507 |
| D. Health Insurance Reserve | <u>8,173,809</u> |
| E. Total Actuarial Present Value of Expected Future Benefit Payments | \$136,291,723 |

Financing \$128.1 Million of Benefit Promises June 30, 1997



COMMENTS AND CONCLUSION

COMPUTED CONTRIBUTIONS: There was a decrease in the computed contribution rate this year from 5.62% to 0.53% of payroll as follows:

| | % of Payroll |
|-------------------------------|---------------------|
| Computed Contribution 6/30/96 | 5.62% |
| Experience | <u>(5.09)</u> |
| Computed Contribution 6/30/97 | 0.53% |

OVERALL EXPERIENCE was more favorable than assumed during the year ending June 30, 1997- primarily as a result of recognized investment return that was greater than assumed (see page B-13).

HEALTH INSURANCE: The following develops the balance of the Health Insurance Reserve as of June 30, 1997 assuming a maximum contribution is made to the reserve:

| | |
|---|-------------|
| Balance as of June 30, 1996 | \$8,479,772 |
| Contribution to HI Reserve for the year ended June 30, 1997 | 511,933* |
| HI premiums paid during the year ended June 30, 1997 | 1,954,240 |
| Interest (14.6% assuming mid-year transactions) | 1,136,344 |
| Balance as of June 30, 1997 | \$8,173,809 |

* In accordance with section 401(h) of the Internal Revenue Code, the maximum contribution allocable to the Health Insurance Reserve in any given year is 25% of the smaller of (i) total member and employer contributions to the Retirement System, and (ii) the total normal cost contribution. For the year ended June 30, 1997 the maximum contribution to the Health Insurance Reserve was computed to be \$511,933.

RESERVE TRANSFERS: The actuarial present value of benefits payable to General and Police-Fire retirants and beneficiaries on the rolls as of June 30, 1997 exceeded the reserves allocated to the General and Police-Fire divisions in the Reserve for Retired Benefit Payments by \$1,904,197 and \$1,499,536 respectively. In accordance with the Retirement System Ordinance, we recommend the transfer of \$1,904,197 and \$1,499,536 from the Reserves for Employer Contributions to the Reserves for Retired Benefit Payments, General and Police-Fire, respectively.

CONCLUSION: The City of Royal Oak Retirement System is in excellent financial condition in accordance with actuarial principles of level percent of payroll funding.

**ACTUARIAL ACCRUED LIABILITIES & ASSETS
COMPARATIVE STATEMENT**

| Valuation Date | Actuarial Accrued Liability (AAL) (\$1,000s) | Valuation Assets (\$1,000s) | Unfunded Actuarial Accrued Liability (UAAL) (\$1,000s) | Ratio of Valuation Assets to AAL | Ratio of UAL to Valuation Payroll |
|-----------------------|---|------------------------------------|---|---|--|
| 5-31-81* | \$39,882 | \$26,639 | \$13,243 | 66.8% | 135.7% |
| 5-31-82 | 42,732 | 29,588 | 13,144 | 69.2 | 138.0 |
| 5-31-83 | 44,987 | 32,648 | 12,339 | 72.6 | 139.5 |
| 5-31-84* | 49,397 | 35,642 | 13,755 | 72.2 | 139.2 |
| 5-31-85 | 52,062 | 38,438 | 13,624 | 73.8 | 132.5 |
| 5-31-86 | 52,625 | 41,593 | 11,032 | 79.0 | 105.6 |
| 5-31-87* | 57,698 | 45,963 | 11,735 | 79.7 | 102.1 |
| 5-31-88 | 61,331 | 51,036 | 10,295 | 83.2 | 86.0 |
| 5-31-89* | 65,212 | 54,259 | 10,953 | 83.2 | 93.8 |
| 5-31-90* | 68,924 | 58,438 | 10,486 | 84.8 | 84.2 |
| 5-31-91* | 73,106 | 62,262 | 10,844 | 85.2 | 82.7 |
| 5-31-92* | 77,429 | 69,859 | 7,570 | 90.2 | 58.9 |
| 6-30-93* | 84,193 | 77,427 | 6,766 | 92.0 | 49.5 |
| 6-30-94* | 88,519 | 88,519 | 0 | 100.0 | - |
| 6-30-95* | 92,495 | 97,795 | (5,300) | 105.7 | - |
| 6-30-96 | 94,730 | 105,572 | (10,842) | 111.4 | - |
| 6-30-97 | 97,622 | 116,317 | (18,695) | 119.2 | - |

* After changes in benefit provisions and/or actuarial assumptions and actuarial cost methods.

The Ratio of Present Assets to AAL is a traditional measure of a system's funding progress. Except in years when the system is amended or actuarial assumptions are revised this ratio can be expected to increase (or decrease) gradually toward 100%.

The Ratio of UAAL to Valuation Payroll is another relative index of condition. Unfunded actuarial accrued liabilities represent debt, while active member payroll represents the system's capacity to collect contributions to pay toward debt. The lower the ratio, the greater the financial strength - and vice-versa.

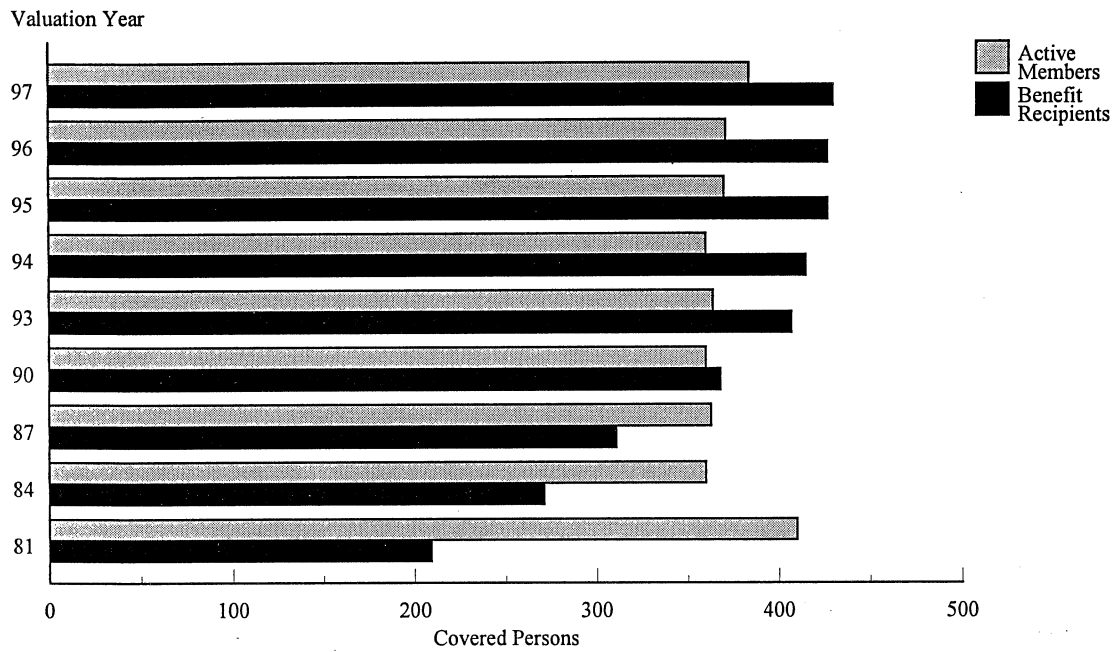
COMPUTED EMPLOYER CONTRIBUTIONS COMPARATIVE STATEMENT

| Valuation Date | Active Members | | | Retirants & Beneficiaries | | | Employer Contributions As Payroll Percents | | | |
|-------------------|----------------|-------------------|----------|---------------------------|-----------------------|----------------|---|--------------------|------------------|----------|
| | No. | Valuation Payroll | | No. | Active Per Retired | Annual Payroll | | General & Water | Police & Fire | Wt. Avg. |
| | | Total | Average | | | % Incr. | \$ | | | |
| 5-31-80* | 424 | \$9,333,285 | \$22,012 | 189 | 2.2 | \$ 944,037 | 10.1% | 19.23% | 28.38% | |
| 5-31-81* | 410 | 9,762,463 | 23,811 | 209 | 2.0 | 1,133,043 | 11.6 | 18.08 | 25.80 | |
| 5-31-82 | 376 | 9,523,807 | 25,329 | 231 | 1.6 | 1,380,622 | 14.5 | 17.86 | 25.72 | |
| 5-31-83 | 348 | 8,847,234 | 25,423 | 263 | 1.3 | 1,792,492 | 20.3 | 17.77 | 25.53 | |
| 5-31-84* | 360 | 9,878,860 | 27,441 | 271 | 1.3 | 1,910,405 | 19.3 | 16.64 | 23.28 | |
| 5-31-85 | 358 | 10,280,426 | 28,716 | 288 | 1.2 | 2,125,341 | 20.7 | 16.49 | 22.68 | |
| 5-31-86 | 359 | 10,450,609 | 29,110 | 297 | 1.2 | 2,236,500 | 21.4 | 16.05 | 21.24 | |
| 5-31-87* | 363 | 11,491,099 | 31,656 | 311 | 1.2 | 2,495,645 | 21.7 | 16.34 | 22.60 | |
| 5-31-88 | 364 | 11,974,522 | 32,897 | 330 | 1.1 | 2,842,657 | 23.7 | 15.75 | 22.26 | |
| 5-31-89* | 357 | 11,681,433 | 32,721 | 363 | 0.98 | 3,535,678 | 30.3 | 17.39 | 22.32 | |
| 5-31-90* | 360 | 12,453,638 | 34,593 | 368 | 0.98 | 3,594,058 | 28.9 | 16.95 | 23.12 | |
| 5-31-91* | 357 | 13,112,701 | 36,730 | 374 | 0.95 | 3,763,075 | 28.7 | 16.50 | 24.52 | |
| 5-31-92# | 352 | 12,844,067 | 36,489 | 395 | 0.89 | 4,317,111 | 33.6 | 15.53 | 23.58 | |
| 6-30-93* | 364 | 13,664,416 | 37,540 | 407 | 0.89 | 4,597,263 | 33.6 | 17.02 | 22.50 | |
| 6-30-94* | 360 | 14,109,602 | 39,193 | 415 | 0.87 | 4,894,145 | 34.7 | 11.85 | 15.16 | 13.48% |
| 6-30-95* | 370 | 14,595,387 | 39,447 | 427 | 0.87 | 5,375,306 | 36.8 | 9.45 | 9.75 | 9.59 |
| 6-30-96 | 371 | 14,991,326 | 40,408 | 427 | 0.87 | 5,529,852 | 36.9 | 5.07 | 6.20 | 5.62 |
| 6-30-97 | 384 | 15,949,326 | 41,535 | 430 | 0.89 | 5,647,518 | 35.4 | 0.60 | 0.42 | 0.53 |

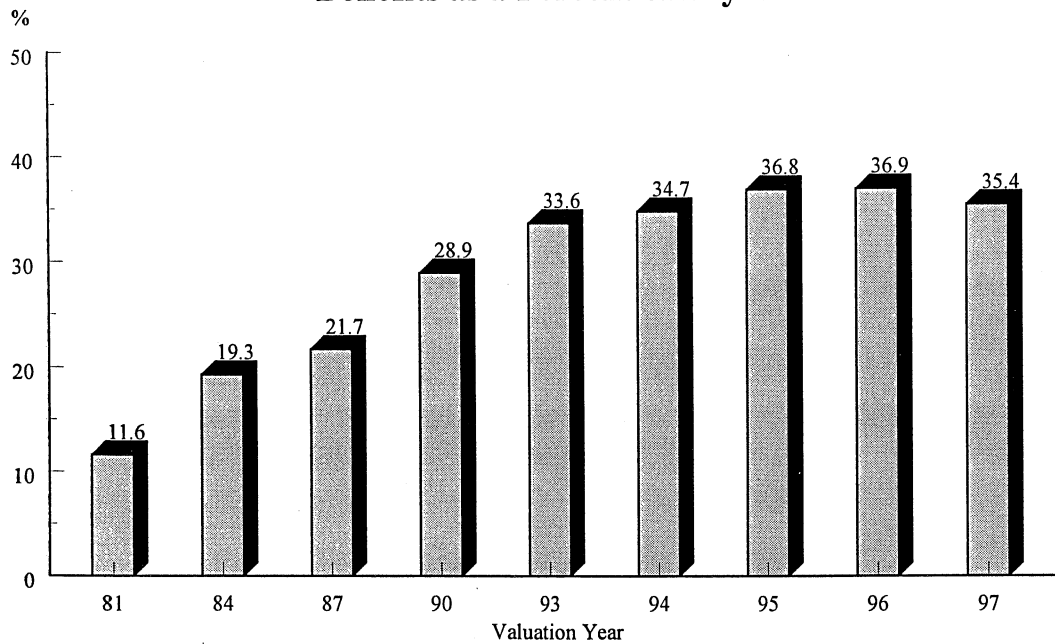
* After changes in benefit provisions, actuarial assumptions and/or actuarial cost methods.

A smoothed funding value of assets was first used for the May 31, 1992 valuation, instead of the previously used book value.

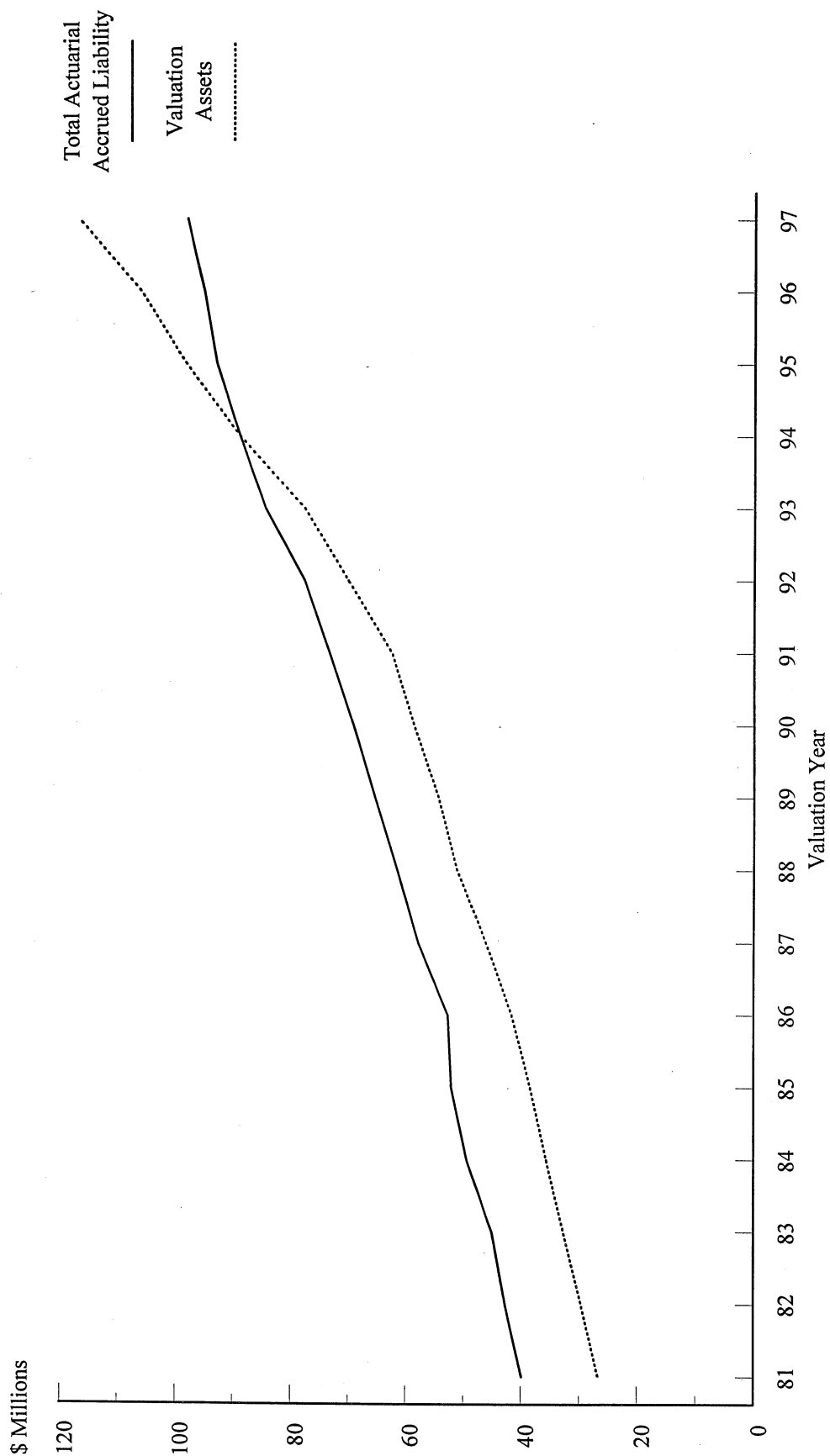
Active Members & Benefit Recipients



Benefits as a Percent of Payroll



Assets & Accrued Liabilities



Section B

Summary of Benefit Provisions and Valuation Data

SUMMARY OF BENEFIT PROVISIONS EVALUATED

JUNE 30, 1997

REGULAR RETIREMENT (no reduction factor for age):

Eligibility - Permanent - AFSCME, Executive Department Heads, Department Heads and Deputies, Technical and Professional, Police Service Aides: Age 55 with 25 years of service or age 60 with 5 years of service.

Supervisors, Local 270M: Age 50 with 30 years of service or age 60 with 5 years of service.

Police Command, Police Officers, Detectives: 25 years of service regardless of age, or age 55 with 10 years of service. Fire Fighters: Age 50 with 25 years of service or age 55 with 10 years of service.

Temporary Eligibility Until June 30, 2000 - Executive Department Heads, Department Heads and Deputies, AFSCME, Technical and Professional, and Supervisor members are eligible for regular retirement at age 50 with 25 years of service, age 55 with 20 years of service or age 60 with 5 years of service.

Local 270M members are eligible for regular retirement at 30 years of service regardless of age, age 50 with 25 years of service, age 55 with 20 years of service or age 60 with 5 years of service.

Type of Final Average Compensation (FAC): Executive Department Heads, Supervisors, AFSCME, Technical and Professional, Police Command, Detectives, Fire Fighters: Highest 2 years out of last 10 years. All others: Highest 2 consecutive years out of last 10 years.

Annual Amount - General: Total service times 2.2% of FAC with a maximum allowance of 75% of FAC. Police Service Aides: Total service times 2.0% of FAC with a maximum allowance of 80% of FAC minus the member's initial primary insurance amount under Social Security.

Police Officers, Command Officers, Detectives, Fire Fighters: FAC times the sum of 2.8% for each of the first 20 years of service, 2.0% for each of the next 6 years, and 1% for each year of service thereafter to maximum of 75% of FAC.

DEFERRED RETIREMENT (vested benefit):

Eligibility - General: 5 years of service.

- Police Command, Police Officers, Detectives, Police Service Aides, Fire Fighters: 10 years of service.

Annual Amount - Same as regular retirement but based upon service and final average compensation at time of termination.

AFSCME, Executive Department Heads, Department Heads and Deputies, Technical and Professional, Police Service Aides: Payable at age 60 with 5 years of service, or age 55 with 25 years of service.

SUMMARY OF BENEFIT PROVISIONS EVALUATED
JUNE 30, 1997
(CONTINUED)

Supervisor and Local 270M: Payable at age 50 with 30 years of service or age 60 with 5 years of service.

Police Command, Fire Fighters: Payable at age 50 with 25 years of service, or age 55 with 10 years of service.

Police Officers, Detectives: Payable at age 55 with 10 years of service.

DUTY DISABILITY RETIREMENT:

Eligibility - No age or service requirements.

Annual Amount - AFSCME: 66-2/3% of base monthly salary, with recomputation to 70% after 5 years of disability and 75% after 10 years. Maximum benefit is \$2,000/mo.

Other General: 66-2/3% of base monthly salary at time of injury. Benefit is payable until voluntary retirement age.

Maximum monthly benefit:

- Dept. Heads & Deputies is \$5,000.
- Professional & Technical is \$3,500.
- Local 270M, Supervisors is \$2,000.

Police Command, Police Officers and Detectives: 66-2/3% of base monthly salary at time of injury. Benefit is payable until age 55. Worker's compensation is offset.

Maximum monthly benefit:

- Police Officers is \$2,000.
- Police Command is \$2,500.
- Detectives is \$2,500.

Police Service Aides: 66-2/3% of base monthly salary at time of injury. Benefit is payable until age 60. Worker's compensation is offset. Maximum monthly benefit is \$2,000.

Fire Fighters: 66-2/3% of base monthly salary at time of injury. Benefit is payable until individual reaches minimum retirement requirements. Worker's compensation is offset. Maximum monthly benefit is \$2,000.

NON-DUTY DISABILITY RETIREMENT:

Eligibility - Local 270-M: 10 years of service.
- Others: 5 years of service.

Annual Amount - Fire Fighters: 50% of base monthly salary at time of disability. Benefits are payable the same as duty disability.

Others: 66-2/3% of base monthly salary at time of disability. Benefits are payable the same as duty disability.

SUMMARY OF BENEFIT PROVISIONS EVALUATED
JUNE 30, 1997
(CONTINUED)

DUTY DEATH BEFORE RETIREMENT:

Eligibility - No age or service requirements.

Annual Amount - Computed as regular retirement but with additional service credit from date of death until date age 60 would have been attained. Spouse is paid 75% of regular retirement benefit; 1 or 2 unmarried children under age 19 - 10% of regular retirement benefit per child; 3 or more unmarried children under age 19 - an equal share of 25% of regular retirement benefit; unmarried children under age 19 and no spouse - an equal share of 75% of regular retirement benefit. Worker's Compensation payments are offset. Maximum benefit for Police & Fire is 75% of final average earnings. Maximum benefit for Local 270M and Supervisors is 75% of FAC. Maximum benefit for all others is 80% of FAC.

NON-DUTY DEATH BEFORE RETIREMENT:

Eligibility - 3 years of service.

Annual Amount - Same as duty death retirement.

AUTOMATIC DEATH BENEFIT AFTER RETIREMENT:

75% of a retiree's straight life pension will be continued to an eligible surviving spouse upon retiree's death with no corresponding reduction in straight life pension.

LUMP SUM DEATH BENEFIT AFTER RETIREMENT:

\$4,000 for all divisions.

MEMBER CONTRIBUTIONS:

| | Percent of Annual Compensation | |
|--|---------------------------------|-----------------------------------|
| | To Social Security Wage Base | Over Social Security Wage Base |
| AFSCME | 3.00% | 5.00% |
| Executive Department Heads, Department Heads and Deputies | 3.50 | 5.50 |
| Technical and Professional | 4.00 | 6.00 |
| Other General | 5.00 | 7.00 |
| Police Service Aides | 3.00 | 5.00 |
| Police Command, Police Officers, Detectives & Fire Fighters | 5.00 | 5.00 |

ANNUITY WITHDRAWAL:

Members may withdraw their accumulated member contributions upon retirement with a corresponding reduction in pension amount.

| Valuation Date | Added to Rolls | | Removed from Rolls | | | Net Increase | | Rolls End of Year | |
|----------------|----------------|-------------------|--------------------|------|-------------------|--------------|-------------------|-------------------|-------------------|
| | No. | Annual Allowances | No. | | Annual Allowances | No. | Annual Allowances | No. | Annual Allowances |
| | | | A | E | | | | | |
| 5/31/76 | 5 | \$ 33,384 | | | \$ | 5 | \$ 33,384 | 143 | \$ 495,435 |
| 5/31/77 | 18 | 178,635 | 2 | | 80,268 | 16 | 98,367 | 159 | 593,802 |
| 5/31/78 | 23 | 191,026 | 6 | | 18,195 | 17 | 172,831 | 176 | 766,633 |
| 5/31/79 | 15 | 432,006 | 4 | | 315,957 | 11 | 116,049 | 187 | 882,682 |
| 5/31/80 | 15 | 87,659 | 13 | | 26,304 | 2 | 61,355 | 189 | 944,037 |
| 5/31/81 | 24 | 544,336 | 4 | | 355,330 | 20 | 189,006 | 209 | 1,133,043 |
| 5/31/82 | 33 | 336,714 | 11 | | 89,135 | 22 | 247,579 | 231 | 1,380,622 |
| 5/31/83 | 42 | 453,290 | 10 | | 41,420 | 32 | 411,870 | 263 | 1,792,492 |
| 5/31/84 | 17 | 175,727 | 9 | | 57,814 | 8 | 117,913 | 271 | 1,910,405 |
| 5/31/85 | 29 | 283,601 | 12 | 8.8 | 68,665 | 17 | 214,936 | 288 | 2,125,341 |
| 5/31/86 | 17 | 147,292 | 8 | 9.3 | 36,133 | 9 | 111,159 | 297 | 2,236,500 |
| 5/31/87 | 22 | 288,998 | 8 | 9.9 | 29,853 | 14 | 259,145 | 311 | 2,495,645 |
| 5/31/88 | 26 | 403,952 | 7 | 10.1 | 56,940 | 19 | 347,012 | 330 | 2,842,657 |
| 5/31/89 | 41 | 748,391 | 8 | 10.7 | 55,370 | 33 | 693,021 | 363 | 3,535,678 |
| 5/31/90 | 15 | 184,697 | 10 | 11.8 | 126,317 | 5 | 58,380 | 368 | 3,594,058 |
| 5/31/91 | 18 | 292,334 | 12 | 12.8 | 123,317 | 6 | 169,017 | 374 | 3,763,075 |
| 5/31/92 | 37 | 668,965 | 16 | 13.6 | 114,929 | 21 | 554,036 | 395 | 4,317,111 |
| 6/30/93 | 27 | 408,146 | 15 | 13.9 | 127,994 | 12 | 280,152 | 407 | 4,597,263 |
| 6/30/94 | 26 | 456,550 | 18 | 14.3 | 159,668 | 8 | 296,882 | 415 | 4,894,145 |
| 6/30/95 | 21 | 513,916 | 9 | 13.5 | 32,755 | 12 | 481,161 | 427 | 5,375,306 |
| 6/30/96 | 12 | 272,020 | 12 | 13.5 | 117,474 | 0 | 154,546 | 427 | 5,529,852 |
| 6/30/97 | 19 | 349,731 | 16 | 9.8 | 232,065 | 3 | 117,666 | 430 | 5,647,518 |

A - Represents actual number.

E - Represents expected number based on actuarial assumptions.

RETIREES AND BENEFICIARIES JUNE 30, 1997
TABULATED BY TYPE OF ALLOWANCE BEING PAID

| Type of Allowances Being Paid | Annual Retirement Allowances | | | | | |
|--|------------------------------|--------------------|--------------------------------|--------------------|------------|--------------------|
| | General & Water | | Police Officers & Firefighters | | Totals | |
| | No. | Amount | No. | Amount | No. | Amount |
| Age and Service allowances | | | | | | |
| Regular allowance - benefit | | | | | | |
| Terminating at death of retirant | 84 | \$ 644,061 | 17 | \$ 308,629 | 101 | \$ 952,697 |
| - with potential to spouse | 103 | 1,235,924 | 109 | 2,560,853 | 212 | 3,796,770 |
| Option II allowance - joint and Survivor benefit | 3 | 12,418 | 2 | 7,493 | 5 | 19,911 |
| Option III allowance - modified Joint and survivor benefit | 5 | 26,017 | 2 | 12,431 | 7 | 38,448 |
| Allowance to survivor beneficiary Of deceased retirant | <u>30</u> | <u>128,891</u> | <u>32</u> | <u>376,539</u> | <u>62</u> | <u>505,430</u> |
| Total Age and Service Allowances | 225 | 2,047,311 | 162 | 3,265,945 | 387 | 5,313,256 |
| Casualty Allowances | | | | | | |
| Duty Disability Allowances | | | | | | |
| Regular allowance | 1 | 1,066 | 1 | 3,404 | 2 | 4,470 |
| Modified joint and survivor benefit | 2 | 7,265 | | | 2 | 7,265 |
| Spouse | | | <u>1</u> | <u>3,228</u> | <u>1</u> | <u>3,228</u> |
| Totals | <u>3</u> | <u>8,331</u> | <u>2</u> | <u>6,632</u> | <u>5</u> | <u>14,963</u> |
| Non-Duty Disability Allowances | | | | | | |
| Regular allowance | | | 1 | 9,418 | 1 | 9,418 |
| With potential to spouse | 1 | 6,552 | 3 | 32,217 | 4 | 38,769 |
| Spouse | <u>2</u> | <u>6,211</u> | <u>2</u> | <u>17,860</u> | <u>4</u> | <u>24,071</u> |
| Total | <u>3</u> | <u>12,763</u> | <u>6</u> | <u>59,495</u> | <u>9</u> | <u>72,258</u> |
| Duty Death Allowances | | | | | | |
| Spouse | 1 | 2,102 | | | 1 | 2,102 |
| Non-Duty Death Allowances | | | | | | |
| Spouse | 15 | 134,571 | 9 | 99,952 | 24 | 234,523 |
| Child(ren) | <u>2</u> | <u>5,024</u> | <u>2</u> | <u>5,392</u> | <u>4</u> | <u>10,416</u> |
| Totals | <u>17</u> | <u>139,595</u> | <u>11</u> | <u>105,344</u> | <u>28</u> | <u>244,939</u> |
| Total Casualty Allowances | <u>24</u> | <u>162,791</u> | <u>19</u> | <u>171,471</u> | <u>43</u> | <u>334,262</u> |
| Total Allowances Being Paid | 249 | \$2,210,102 | 181 | \$3,437,416 | 430 | \$5,647,518 |

RETIREES AND BENEFICIARIES JUNE 30, 1997
TABULATED BY ATTAINED AGES

| Attained Ages | Age and Service | | Casualty | | Totals | |
|------------------|-----------------|----------------------|----------|----------------------|--------|----------------------|
| | No. | Annual Allowances | No. | Annual Allowances | No. | Annual Allowances |
| Under 20 | | | 4 | \$ 10,416 | 4 | \$ 10,416 |
| 40 - 44 | | | 1 | 20,220 | 1 | 20,220 |
| 45 - 49 | 4 | \$ 94,242 | 2 | 32,364 | 6 | 126,606 |
| 50 - 54 | 18 | 479,848 | 1 | 37,264 | 19 | 517,112 |
| 55 - 59 | 40 | 1,055,428 | 4 | 52,601 | 44 | 1,108,029 |
| 60 - 64 | 50 | 1,022,124 | 5 | 32,847 | 55 | 1,054,971 |
| 65 - 69 | 78 | 1,144,605 | 8 | 80,488 | 86 | 1,225,093 |
| 70 - 74 | 83 | 851,297 | 3 | 23,928 | 86 | 875,225 |
| 75 - 79 | 60 | 410,769 | 6 | 20,393 | 66 | 431,162 |
| 80 | 5 | 23,522 | | | 5 | 23,522 |
| 81 | 11 | 89,468 | 3 | 6,044 | 14 | 95,512 |
| 82 | 6 | 24,238 | 2 | 5,330 | 8 | 29,568 |
| 83 | 7 | 23,504 | 1 | 2,288 | 8 | 25,792 |
| 84 | 6 | 23,053 | | | 6 | 23,053 |
| 85 | 4 | 22,135 | | | 4 | 22,135 |
| 86 | 4 | 17,351 | | | 4 | 17,351 |
| 87 | 2 | 6,330 | | | 2 | 6,330 |
| 88 | 2 | 4,799 | 1 | 3,576 | 3 | 8,375 |
| 89 | 4 | 16,216 | | | 4 | 16,216 |
| 91 | 1 | 635 | | | 1 | 635 |
| 92 | 1 | 3,146 | | | 1 | 3,146 |
| 93 | | | 2 | 6,503 | 2 | 6,503 |
| 99 | 1 | 546 | | | 1 | 546 |
| Totals | 387 | \$5,313,256 | 43 | \$334,262 | 430 | \$5,647,518 |

INACTIVE MEMBERS JUNE 30, 1997
TABULATED BY ATTAINED AGES

Also included in the valuation were 30 General members and 4 Police Officer/Firefighter members who are eligible for estimated deferred allowances of \$248,089 upon attainment of voluntary retirement age. Some of these 34 inactive members are presently covered under either a long-term disability insurance policy or worker's compensation.

| Attained Ages | Estimated Deferred | |
|------------------|--------------------|----------------------|
| | No. | Annual Allowances |
| 29 | 1 | \$ 5,261 |
| 31 | 1 | 4,545 |
| 37 | 1 | 3,860 |
| 41 | 2 | 14,883 |
| 42 | 1 | 7,547 |
| 43 | 1 | 3,094 |
| 44 | 2 | 39,541 |
| 45 | 2 | 4,000 |
| 46 | 3 | 32,962 |
| 48 | 2 | 23,356 |
| 50 | 1 | 3,222 |
| 51 | 1 | 24,000 |
| 52 | 2 | 21,372 |
| 53 | 2 | 13,319 |
| 54 | 2 | 5,487 |
| 57 | 3 | 12,475 |
| 58 | 4 | 20,091 |
| 60 | 2 | 6,240 |
| 67 | 1 | 2,835 |
| Totals | 34 | \$248,089 |

ACTIVE MEMBERS -- COMPARATIVE SCHEDULE

| Valuation Date | Active Members | Valuation Payroll | Average | | | |
|----------------|----------------|-------------------|-----------|-----------|----------|---------|
| | | | Age | Service | Pay | % Incr. |
| 5-31-80 | 424 | \$ 9,333,285 | 45.2 yrs. | 14.2 yrs. | \$22,012 | |
| 5-31-81 | 410 | 9,762,463 | 44.9 | 14.2 | 23,811 | 8.2% |
| 5-31-82 | 376 | 9,523,807 | 45.0 | 14.3 | 25,329 | 6.4 |
| 5-31-83 | 348 | 8,847,234 | 44.2 | 13.8 | 25,423 | 0.4 |
| 5-31-84 | 360 | 9,878,860 | 44.3 | 13.6 | 27,441 | 7.9 |
| 5-31-85 | 358 | 10,280,426 | 44.1 | 13.3 | 28,716 | 4.6 |
| 5-31-86 | 359 | 10,450,609 | 43.8 | 13.2 | 29,110 | 1.4 |
| 5-31-87 | 363 | 11,491,099 | 43.7 | 12.9 | 31,656 | 8.7 |
| 5-31-88 | 364 | 11,974,522 | 43.3 | 12.6 | 32,897 | 3.9 |
| 5-31-89 | 357 | 11,681,433 | 42.0 | 11.2 | 32,721 | (0.5) |
| 5-31-90 | 360 | 12,453,638 | 42.0 | 11.4 | 34,593 | 5.7 |
| 5-31-91 | 357 | 13,112,701 | 42.2 | 11.8 | 36,730 | 6.2 |
| 5-31-92 | 352 | 12,844,067 | 41.9 | 11.6 | 36,489 | (0.7) |
| 6-30-93 | 364 | 13,664,416 | 41.7 | 11.5 | 37,540 | 2.9 |
| 6-30-94 | 360 | 14,109,602 | 41.6 | 11.3 | 39,193 | 4.4 |
| 6-30-95 | 370 | 14,595,387 | 41.3 | 10.8 | 39,447 | 0.6 |
| 6-30-96 | 371 | 14,991,326 | 41.5 | 10.9 | 40,408 | 2.4 |
| 6-30-97 | 384 | 15,949,325 | 41.8 | 10.8 | 41,535 | 2.8 |

ACTIVE MEMBERS - JUNE 30, 1997

| Group | Active Members | Valuation Payroll |
|-----------------------------------|----------------|-------------------|
| Local 270 | 70 | \$ 2,436,126 |
| Department Heads and Deputies | 29 | 1,911,103 |
| Technical and Professional | 35 | 1,368,004 |
| AFSCME | 69 | 2,222,561 |
| General - Foremen and Supervisors | 6 | 285,752 |
| Police Service Aides | 12 | 377,537 |
| Police | 70 | 3,083,331 |
| Fire | 69 | 2,975,375 |
| Police Command | 12 | 679,000 |
| Police Detectives | 10 | 514,266 |
| Judges | 2 | 96,270 |
| Total | 384 | \$15,949,325 |

ACTIVE MEMBERS ADDED TO AND REMOVED FROM ROLLS

| Year Ended | Number Added During Year | | Terminations During Year | | | | | | | | Active Members End of Year |
|---------------|-----------------------------------|-----|--------------------------|-------|----------|------|------------------|------|-----------------------|-------|-------------------------------------|
| | | | Normal Retirement | | Disabled | | Death Service | | Other Terminations | | |
| | A | E | A | E | A | E | A | E | A | E | |
| 5-31-1980 | 7 | | 9 | | | | | | 47 | | 424 |
| 5-31-1981 | 26 | 40 | 13 | 9.4 | 1 | 2.3 | 1 | 1.8 | 25 | 11.7 | 410 |
| 5-31-1982 | 18 | 52 | 24 | 12.1 | 6 | 2.1 | 1 | 1.7 | 21 | 11.3 | 376 |
| 5-31-1983 | 21 | 49 | 34 | 10.1 | 4 | 2.0 | | 1.4 | 11 | 9.8 | 348 |
| 5-31-1984 | 31 | 19 | 8 | 7.6 | 0 | 1.9 | 0 | 1.2 | 11 | 8.7 | 360 |
| 5-31-1985 | 28 | 30 | 17 | 10.8 | 3 | 2.9 | 0 | 1.2 | 10 | 10.1 | 358 |
| 5-31-1986 | 25 | 24 | 11 | 10.0 | 0 | 3.0 | 0 | 1.3 | 13 | 11.3 | 359 |
| 5-31-1987 | 27 | 23 | 13 | 10.1 | 1 | 2.8 | 1 | 1.3 | 8 | 12.3 | 363 |
| 5-31-1988 | 27 | 26 | 14 | 13.4 | 0 | 2.7 | 3 | 1.2 | 9 | 12.9 | 364 |
| 5-31-1989 | 36 | 43 | 33 | 12.9 | 1 | 2.8 | 0 | 1.2 | 9 | 12.3 | 357 |
| 5-31-1990 | 24 | 21 | 6 | 11.0 | 0 | 2.6 | 1 | 1.1 | 14 | 13.6 | 360 |
| 5-31-1991 | 16 | 19 | 8 | 11.7 | 1 | 2.7 | 1 | 1.0 | 9 | 13.2 | 357 |
| 5-31-1992 | 24 | 29 | 21 | 12.9 | 0 | 2.4 | 1 | 1.0 | 7 | 11.6 | 352 |
| 6-30-1993 | 30 | 18 | 12 | 10.5 | 0 | 2.3 | 2 | 1.1 | 4 | 11.3 | 364 |
| 6-30-1994 | 25 | 29 | 16 | 10.5 | 2 | 2.3 | 1 | 1.0 | 10 | 11.9 | 360 |
| 6-30-1995 | 37 | 27 | 14 | 10.2 | 2 | 1.4 | 2 | 0.9 | 9 | 11.8 | 370 |
| 6-30-1996 | 27 | 26 | 8 | 9.3 | 0 | 1.3 | 0 | 0.8 | 18 | 14.0 | 371 |
| 6-30-1997 | 30 | 17 | 8 | 11.2 | 0 | 1.4 | 0 | 0.8 | 9 | 14.5 | 384 |
| 1981-1997 | 452 | 492 | 260 | 183.7 | 21 | 38.9 | 14 | 20.0 | 197 | 202.3 | |

A - represents actual number.

E - represents expected number based on actuarial assumptions.

CITY OF ROYAL OAK GENERAL AND WATER MEMBERS
BY ATTAINED AGE AND YEARS OF SERVICE

| Age Group | Years of Accrued Service | | | | | | | Totals | |
|-----------|--------------------------|-----|-------|-------|-------|-------|-------|--------|-------------|
| | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 Up | No. | Salary |
| 20-24 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | \$ 90,293 |
| 25-29 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 8 | 226,750 |
| 30-34 | 14 | 3 | 3 | 0 | 0 | 0 | 0 | 20 | 675,802 |
| 35-39 | 15 | 9 | 7 | 0 | 1 | 0 | 0 | 32 | 1,127,912 |
| 40-44 | 7 | 13 | 8 | 8 | 1 | 0 | 0 | 37 | 1,570,888 |
| 45-49 | 12 | 7 | 6 | 6 | 6 | 6 | 0 | 43 | 1,787,650 |
| 50-54 | 8 | 7 | 5 | 6 | 3 | 9 | 0 | 38 | 1,636,303 |
| 55-59 | 4 | 3 | 3 | 5 | 1 | 1 | 3 | 20 | 872,591 |
| 60 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 63,118 |
| 61 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 60,619 |
| 62 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 30,538 |
| 64 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 74,094 |
| 66 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 31,125 |
| 68 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 39,835 |
| 74 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 32,299 |
| Totals | 72 | 45 | 34 | 26 | 14 | 16 | 4 | 211 | \$8,319,817 |

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

Group Averages:

Age: 46.4 years
Service: 10.6 years
Annual Pay: \$39,430

CITY OF ROYAL OAK POLICE AND FIRE MEMBERS
BY ATTAINED AGE AND YEARS OF SERVICE

| Age Group | Years of Accrued Service | | | | | | | Totals | |
|-----------|--------------------------|-----|-------|-------|-------|-------|---------|--------|-------------|
| | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 Plus | No. | Salary |
| 20-24 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | \$ 32,913 |
| 25-29 | 24 | 6 | 0 | 0 | 0 | 0 | 0 | 30 | 1,168,523 |
| 30-34 | 12 | 27 | 1 | 0 | 0 | 0 | 0 | 40 | 1,640,756 |
| 35-39 | 5 | 19 | 8 | 0 | 0 | 0 | 0 | 32 | 1,386,482 |
| 40-44 | 1 | 7 | 10 | 5 | 2 | 0 | 0 | 25 | 1,136,122 |
| 45-49 | 0 | 0 | 2 | 11 | 10 | 5 | 0 | 28 | 1,440,614 |
| 50-54 | 2 | 0 | 1 | 0 | 1 | 8 | 0 | 12 | 590,058 |
| 55-59 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 4 | 181,528 |
| 61 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 52,514 |
| Totals | 45 | 59 | 22 | 16 | 15 | 13 | 3 | 173 | \$7,629,510 |

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

Group Averages:

Age: 38.4 years
Service: 10.9 years
Annual Pay: \$44,101

SUMMARY OF CURRENT ASSET INFORMATION
FURNISHED FOR VALUATION

Balance Sheet

| Reported Assets | | Reserves for | |
|-----------------------------|----------------------|---------------------------------|----------------------|
| Cash & equivalents | \$ 2,242,222 | Employees' contributions | \$ 7,443,766 |
| Other short-term | 2,063,582 | Employer contributions | 9,905,285 |
| Receivables & accruals | (4) | Retired benefit payments | 51,549,705 |
| Stocks | 88,704,385 | Undistributed investment income | 76,173,698 |
| Bonds | 52,249,995 | | |
| Other | <u>(187,726)</u> | | |
| Total Current Assets | \$145,072,454 | Total Reserves | \$145,072,454 |

Revenues and Expenditures

| | 1996-97 | 1995-96 |
|---|----------------------|----------------------|
| Balance - Beginning of year | \$107,236,456 | \$100,535,970 |
| Revenues | | |
| Employees' contributions | 729,444 | 650,989 |
| Employer contributions | 1,399,698 | 1,901,974 |
| Investment income (net) | <u>44,073,771</u> | <u>11,982,868</u> |
| Total | 46,202,913 | 14,535,831 |
| Expenditures | | |
| Benefit payments | 5,895,365 | 5,473,597 |
| Health insurance premiums for retired members | 1,954,239 | 1,865,624 |
| Refund of member contributions | 34,700 | 24,010 |
| Administrative expenses | <u>482,611</u> | <u>472,114</u> |
| Total | 8,366,915 | 7,835,345 |
| Balance - End of year | \$145,072,454 | \$107,236,456 |

DEVELOPMENT OF FUNDING VALUE OF RETIREMENT SYSTEM ASSETS

| Year Ended June 30: | 1996 | 1997 | 1998 | 1999 | 2000 |
|--|----------------|----------------|-------------|-------------|-------------|
| A. Funding Value Beginning of Year | \$ 106,550,614 | \$ 114,051,561 | | | |
| B. Market Value End of Year | 124,417,112 | 145,072,454 | | | |
| C. Market Value Beginning of Year | 111,827,754 | 124,417,112 | | | |
| D. Non-Investment/Administrative Net Cash Flow | (4,810,268) | (5,755,163) | | | |
| E. Investment Income | | | | | |
| E1. Market Total: B - C - D | 17,399,626 | 26,410,505 | | | |
| E2. Amount for Immediate Recognition (7.75%) | 8,071,275 | 8,615,983 | | | |
| E3. Amount for Phased-In Recognition: E1-E2 | 9,328,351 | 17,794,522 | | | |
| F. Phased-In Recognition of Investment Income | | | | | |
| F1. Current Year: 0.25 x E3 | 2,332,088 | 4,448,631 | | | |
| F2. First Prior Year | 2,571,294 | 2,332,088 | \$4,448,631 | | |
| F3. Second Prior Year | (1,773,302) | 2,571,294 | 2,332,088 | \$4,448,631 | |
| F4. Third Prior Year | 1,109,860 | (1,773,300) | 2,571,294 | 2,332,087 | \$4,448,629 |
| F5. Total Recognized Investment Gain | 4,239,940 | 7,578,713 | 9,352,013 | 6,780,718 | 4,448,629 |
| G. Funding Value End of Year: A + D + E2 + F5 | \$114,051,561 | \$124,491,092 | | | |
| H. Difference between Market & Funding Value | 10,365,551 | 20,581,360 | 11,229,347 | 4,448,629 | 0 |
| I. Recognized Rate of Return | 11.8% | 14.6% | | | |

The Funding Value of Assets recognizes assumed investment income (line E2) fully each year. Differences between actual and assumed investment income (line E3) are phased in over a closed 4 year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than market value. The Funding Value of Assets is **unbiased** with respect to Market Value. At any time it may be either greater or less than Market Value. If actual and assumed rates of investment income are exactly equal for 4 consecutive years, the Funding Value will become equal to Market Value.

Section C

Summary of Valuation Methods and Assumptions

VALUATION METHODS

Normal cost and the allocation of benefit values between service rendered before and after the valuation date was determined using an individual **entry-age normal cost** valuation method having the following characteristics:

- (i) the annual normal costs for each individual active member, payable from the date of employment to the date of retirement, are sufficient to accumulate the value of the member's benefit at the time of retirement;
- (ii) each annual normal cost is a constant percentage of the member's year by year projected covered pay.

Financing of Unfunded Actuarial Accrued Liabilities. Assets in excess of actuarial accrued liabilities were amortized by level (principal & interest combined) percent of payroll contributions over a period of **10** years.

ACTUARIAL ASSUMPTIONS USED IN THE VALUATION

The actuary calculates the contribution requirements and benefit values of the plan by applying actuarial assumptions to the benefit provisions and census data furnished, using the valuation method described on page C-1.

The principal areas of financial risk which require assumptions about future experience are:

- long-term rates of investment income
- patterns of salary increases
- rates of mortality before and after retirement
- rates of withdrawal from active membership
- rates of disability among members and their subsequent rates of recovery
- probabilities of retirement at various ages after benefit eligibility.

In a valuation the monetary effect of each assumption, for each distinct experience group, is projected for the next year and for each year over the next half-century or longer.

Actual experience will not coincide exactly with assumed experience, regardless of the skill of the actuary, the completeness of the data and the precision of the many calculations that are made. Each valuation provides a complete recalculation of system obligations based upon assumptions regarding future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of small adjustments of the computed contribution rate.

From time to time it is appropriate to modify one or more of the assumptions to reflect basic experience trends (but not random year to year fluctuations).

The rates of salary increase used for individual members are in accordance with the following table. This assumption is used to project a member's current salary to the salaries upon which benefit amounts will be based.

| Sample Ages | Annual Rate of Salary Increase for Sample Age | | |
|----------------|---|-------------------|-------------|
| | Base (Economic) | Merit & Longevity | |
| | | General & Water | Police-Fire |
| 20 | 5.0% | 3.8% | 3.0% |
| 25 | 5.0 | 3.1 | 3.0 |
| 30 | 5.0 | 2.7 | 2.6 |
| 35 | 5.0 | 2.4 | 1.1 |
| 40 | 5.0 | 2.1 | 0.2 |
| 45 | 5.0 | 1.7 | 0.2 |
| 50 | 5.0 | 1.1 | 0.2 |
| 55 | 5.0 | 0.7 | 0.1 |
| 60 | 5.0 | 0.2 | -- |
| 65 | 5.0 | -- | -- |

The rate of investment return was 7.75% per year, compounded annually, net after administrative and investment expenses. This assumption is used to make money payable at one point in time equal in value to a different amount of money payable at another point in time.

The assumed real return for funding purposes is the net rate of return in excess of average salary increases. Considering other assumptions used in the valuation, the 7.75% translates to a real return of approximately 2.75%. Experience over the last 5 years has been more favorable than assumed, as illustrated below.

| | Year Ending June 30 | | | | | 5 Year Average |
|-----------------------------|---------------------|-------|-------|-------|---------|-------------------|
| | 1997 | 1996 | 1995 | 1994 | 1993 | |
| 1) Nominal rate* | 14.6% | 11.8% | 14.3% | 11.9% | 13.9%** | 13.3% |
| 2) Increase in CPI | 2.3 | 2.8 | 3.0 | 2.5 | 3.0 | 2.7 |
| 3) Average salary increase# | 2.8 | 2.4 | 0.6 | 4.4 | 2.9** | 2.6 |
| 4) Real return | | | | | | |
| - investment purposes | | | | | | 10.6 |
| - funding purposes | | | | | | 10.7 |

* The nominal rate of return was computed using the approximate formula: $i = I$ divided by $1/2 (A+B-I)$, where I is recognized investment income, A is the beginning of year funding value and B is the end of year funding value.

The average increase in salary for those employees active throughout the year was 5.3%.

** Thirteen month period ended June 30, 1993.

The mortality table was the 1984 Group Annuity Mortality Table set back 0 years for men, and 6 years for women. This assumption is used to measure the probabilities of members dying before retirement and the probabilities of each benefit payment being made after retirement.

| Sample Ages | Single Life Retirement Values | | | |
|----------------|--|----------|-----------------------------------|-------|
| | Present Value of \$1 Monthly for Life | | Future Life Expectancy (Years) | |
| | Men | Women | Men | Women |
| 50 | \$131.79 | \$140.17 | 27.53 | 32.93 |
| 55 | 123.22 | 133.32 | 23.28 | 28.40 |
| 60 | 112.80 | 125.06 | 19.27 | 24.11 |
| 65 | 100.50 | 115.05 | 15.55 | 20.05 |
| 70 | 87.07 | 103.10 | 12.25 | 16.27 |
| 75 | 73.71 | 89.78 | 9.49 | 12.87 |
| 80 | 60.28 | 76.43 | 7.17 | 10.02 |

The rates of retirement used to measure the probability of eligible members retiring during the next year were as follows:

| Retirement Ages | Percent of Eligible Active Members Retiring | | | |
|--------------------|---|-------------------------|--|--------------|
| | General | Police Service Aides | Police Command, Police Officers & Detectives | Firefighters |
| 45-49 | -- % | -- % | 40% | -- % |
| 50 | 15 | -- | 40 | 20 |
| 51 | 10 | -- | 35 | 15 |
| 52 | 10 | -- | 20 | 15 |
| 53 | 10 | -- | 15 | 15 |
| 54 | 10 | -- | 15 | 15 |
| 55 | 10 | 15 | 15 | 15 |
| 56 | 10 | 10 | 15 | 15 |
| 57 | 10 | 10 | 15 | 15 |
| 58 | 10 | 10 | 15 | 25 |
| 59 | 10 | 10 | 25 | 30 |
| 60 | 10 | 10 | 100 | 100 |
| 61 | 10 | 10 | -- | -- |
| 62 | 30 | 30 | -- | -- |
| 63 | 15 | 15 | -- | -- |
| 64 | 15 | 15 | -- | -- |
| 65 | 100 | 100 | -- | -- |

A member was assumed to be eligible for retirement after satisfying the following requirements:

| Group | Eligibility Requirements for Retirement |
|---|--|
| Local 270M | 30 years of service regardless of age; or 50 years of age with 25 years of service; or 55 years of age with 20 years of service; or 60 years of age with 5 years of service |
| Other General & Water | 50 years of age with 25 years of service; or 55 years of age with 20 years of service; or 60 years of age with 5 years of service |
| Fire Fighters | 50 years of age with 25 years of service; or 55 years of age with 10 or more years of service. |
| Police Command, Police Officers & Detectives | 25 years of service regardless of age; or 55 years of age with 10 or more years of service. |
| Police Service Aides | 55 years of age with 25 years of service; or 60 years of age with 5 or more years of service. |

Rates of separation from active membership were as shown below (rates do not apply to members eligible to retire and do not include separation on account of death or disability). This assumption measures the probabilities of members terminating employment before eligibility for an immediate benefit.

| Sample Ages | Years of Service | % of Active Members Separating Within Next Year | | |
|----------------|---------------------|--|--------|--------|
| | | General | Police | Fire |
| ALL | 0 | 20.00% | 10.00% | 10.00% |
| | 1 | 15.00 | 7.00 | 7.00 |
| | 2 | 10.00 | 5.00 | 5.00 |
| | 3 | 8.00 | 4.00 | 4.00 |
| | 4 | 7.00 | 3.50 | 3.50 |
| 25 | 5 & Over | 6.00 | 3.50 | 2.00 |
| 30 | | 5.50 | 2.90 | 1.80 |
| 35 | | 4.40 | 1.50 | 1.30 |
| 40 | | 1.85 | 0.60 | 1.00 |
| 45 | | 1.25 | 0.50 | 0.70 |
| 50 | | 1.25 | 0.50 | 0.50 |
| 55 | | 1.25 | 0.50 | 0.40 |
| 60 | | 1.25 | 0.50 | 0.40 |
| 65 | | 1.25 | 0.50 | 0.40 |

Rates of disability were as follows. This assumption measures the probability of members retiring with a disability benefit.

| Sample Ages | % of Active Members Becoming Disabled Within Next Year | | |
|----------------|---|--------|---------------|
| | General & Water | | Police & Fire |
| | Male | Female | |
| 20 | 0.07% | 0.03% | 0.10% |
| 25 | 0.09 | 0.05 | 0.15 |
| 30 | 0.10 | 0.07 | 0.25 |
| 35 | 0.14 | 0.13 | 0.30 |
| 40 | 0.21 | 0.19 | 0.70 |
| 45 | 0.32 | 0.28 | 0.80 |
| 50 | 0.52 | 0.45 | 0.95 |
| 55 | 0.92 | 0.76 | 1.10 |
| 60 | 1.53 | 1.10 | 1.20 |

Section D

***Required by Statement No. 25 of
The Governmental Accounting
Standards Board***

CITY OF ROYAL OAK RETIREMENT SYSTEM
GASB STATEMENT 25 REQUIRED SUPPLEMENTARY INFORMATION

The information presented in the required supplementary schedules was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial valuation follows:

| | |
|-------------------------------|------------------------|
| Valuation date | June 30, 1997 |
| Actuarial Cost Method | Entry Age |
| Amortization Method | Level percent |
| Remaining amortization period | 10 years |
| Asset valuation method | 4 year smoothed market |
| Actuarial assumption: | |
| Investment rate of return | 7.75% |
| Projected salary increases | 5.0% - 8.8% |
| Includes inflation at | 5% |
| Cost-of-living adjustments | None |

Membership of the plan consisted of the following at June 30, 1997, the date of the latest actuarial valuation.

| | |
|---|------------|
| Retirees and Beneficiaries receiving benefits | 430 |
| Terminated plan members entitled to but not yet receiving benefits | 34 |
| Active plan members | <u>384</u> |
| Total | 848 |

CITY OF ROYAL OAK RETIREMENT SYSTEM
GASB STATEMENT 25 REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Funding Progress

| Actuarial Valuation Date | Actuarial Value of Assets | Actuarial Accrued Liability (AAL) Entry Age | Unfunded AAL (UAAL) | Funded Ratio | Covered Payroll | UAAL as a % of Covered Payroll |
|--------------------------------|---------------------------------|---|---------------------------|-----------------|--------------------|---|
| 5/31/92 | \$69,858,912 | \$77,428,710 | \$7,569,798 | 90.2% | \$12,844,067 | 58.9% |
| 6/30/93 | 77,426,606 | 84,192,619 | 6,766,013 | 92.0 | 13,664,416 | 49.5 |
| 6/30/94 | 88,518,562 | 88,518,562 | 0 | 100.0 | 14,109,602 | - |
| 6/30/95 | 97,794,571 | 92,495,060 | (5,299,511) | 105.7 | 14,595,387 | - |
| 6/30/96 | 105,571,789 | 94,729,657 | (10,842,132) | 111.4 | 14,991,326 | - |
| 6/30/97 | 116,317,283 | 97,622,379 | (18,694,904) | 119.2 | 15,949,326 | - |

Schedule of Employer Contributions

| Fiscal Year Beginning | Contribution Rates as Percents of Valuation Payroll | Computed Dollar Contribution Based On Projected Payroll | Actual Annual Contributions | Percent Contribution |
|--------------------------|---|---|--------------------------------|-------------------------|
| 6/1/93 | 20.51% | \$2,634,280 | \$2,634,280 | 100% |
| 7/1/94 | 16.67 | 2,826,398* | 2,278,026 | 100% |
| 7/1/95 | 13.48 | 1,901,974 | 1,901,974 | 100% |
| 7/1/96 | 9.59 | 1,399,698 | 1,399,698 | 100% |
| 7/1/97 | 5.62 | 842,513 | | |
| 7/1/98 | 0.53 | 84,531 | | |

* Subsequent to the 6/30/93 annual valuation, the Board adopted new assumptions which decreased the computed contribution for the fiscal year beginning 7/1/94 to \$2,278,026.

Section E

Operation of the Retirement System

BASIC FINANCIAL OBJECTIVE AND OPERATION OF THE RETIREMENT SYSTEM

Benefit Promises Made Which Must Be Paid For. A retirement program is an orderly means of handing out, keeping track of, and financing contingent pension promises to a group of employees. As each member of the retirement program acquires a unit of service credit they are, in effect, handed an "IOU" which reads: "The Retirement System promises to pay you one unit of retirement benefits, payments in cash commencing when you retire."

The principal related financial question is: When shall the money required to cover the "IOU" be contributed? This year, when the benefit of the member's service is received? Or, some future year when the "IOU" becomes a cash demand?

The Constitution of the State of Michigan is directed to the question:

"Financial benefits arising on account of service rendered in each fiscal year shall be funded during that year and such funding shall not be used for financing unfunded accrued liabilities."

This Retirement System meets this constitutional requirement by having the following ***Financial Objective: To establish and receive contributions, expressed as percents of active member payroll, which will remain approximately level from year to year*** and will not have to be increased for future generations of taxpayers.

Translated into actuarial terminology, a level percent-of-payroll contribution objective means that the contribution rate must be at least:

Normal Cost (the current value of benefits likely to be paid on account of member's service being rendered in the current year).

... plus ...

Interest on the Unfunded Actuarial Accrued Liability (the difference between the actuarial accrued liability and current system assets).

If contributions to the retirement program are less than the preceding amount, the difference, plus investment earnings not realized thereon, will have to be contributed at some later time, or, benefits will have to be reduced, to satisfy the fundamental fiscal equation under which all retirement programs must operate; that is:

$$B = C + I - E$$

Benefit payments to any group of members and their beneficiaries cannot exceed the sum of:

Contributions received on behalf of the group.

... plus ...

Investment earnings on contributions received

... minus ...

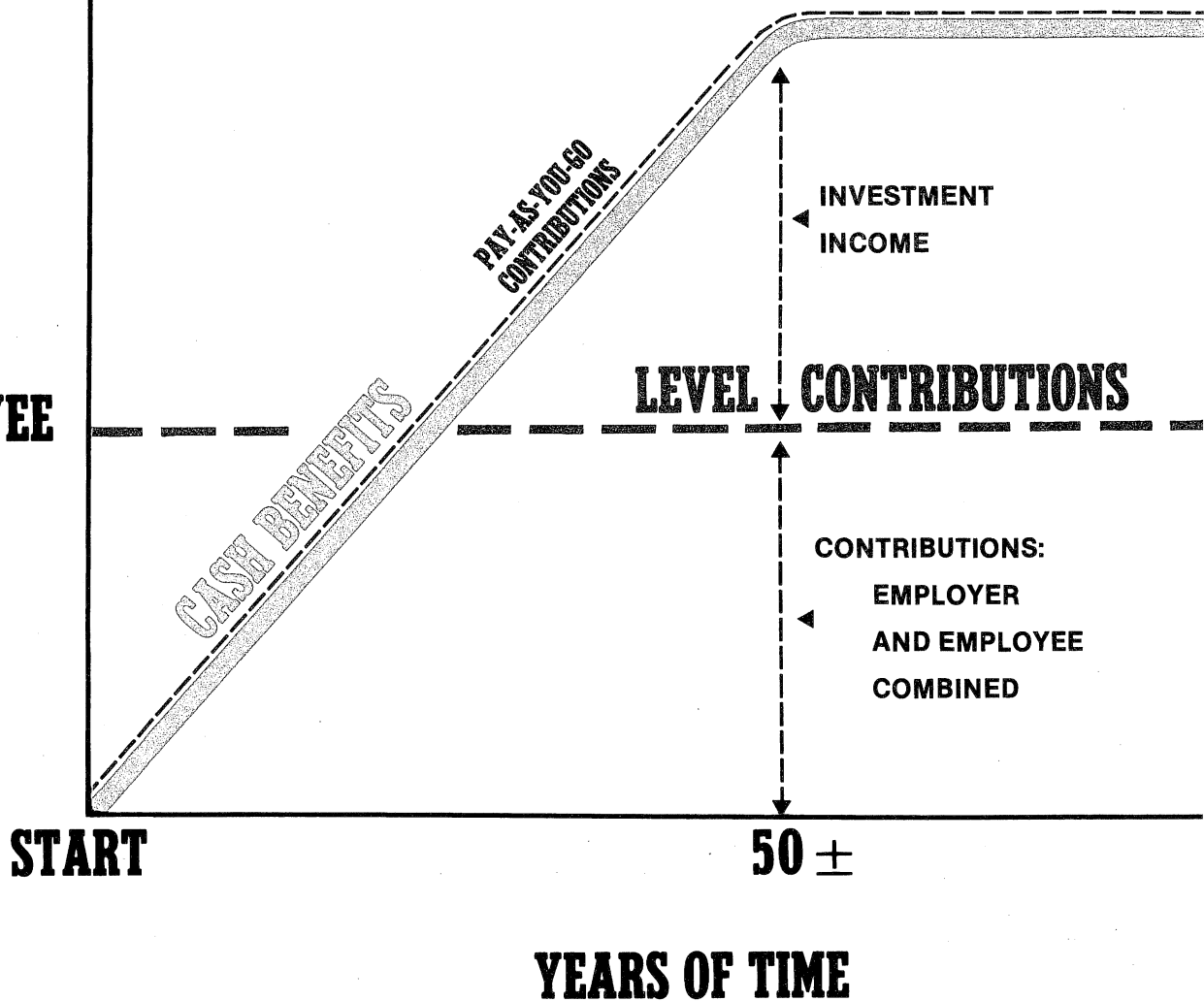
Expenses incurred in operating the program.

A by-product of the level percent-of-payroll contribution objective is the accumulation of invested assets for varying periods of time. Invested assets are a by-product of level percent-of-payroll contributions, not the objective. Investment income becomes a major contributor to the retirement program, and the amount is directly related to the amount of contributions and investment performance.

There are retirement programs designed to defer the bulk of contributions far into the future. Lured by artificially low present contributions, such programs ignore the inevitable consequence of a relentlessly increasing contribution rate -- to a level greatly in excess of the level percent-of-payroll rate. *This method of financing is prohibited in Michigan by the state constitution.*

Computed Contribution Rate Needed to Finance Benefits. From a given schedule of benefits and from the data furnished, the actuary calculates the contribution rate by means of an actuarial valuation - the technique of assigning monetary values to the risks assumed in operating a retirement program.

**% OF
ACTIVE
EMPLOYEE
PAYS**



CASH BENEFITS LINE. This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

LEVEL CONTRIBUTION LINE. Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

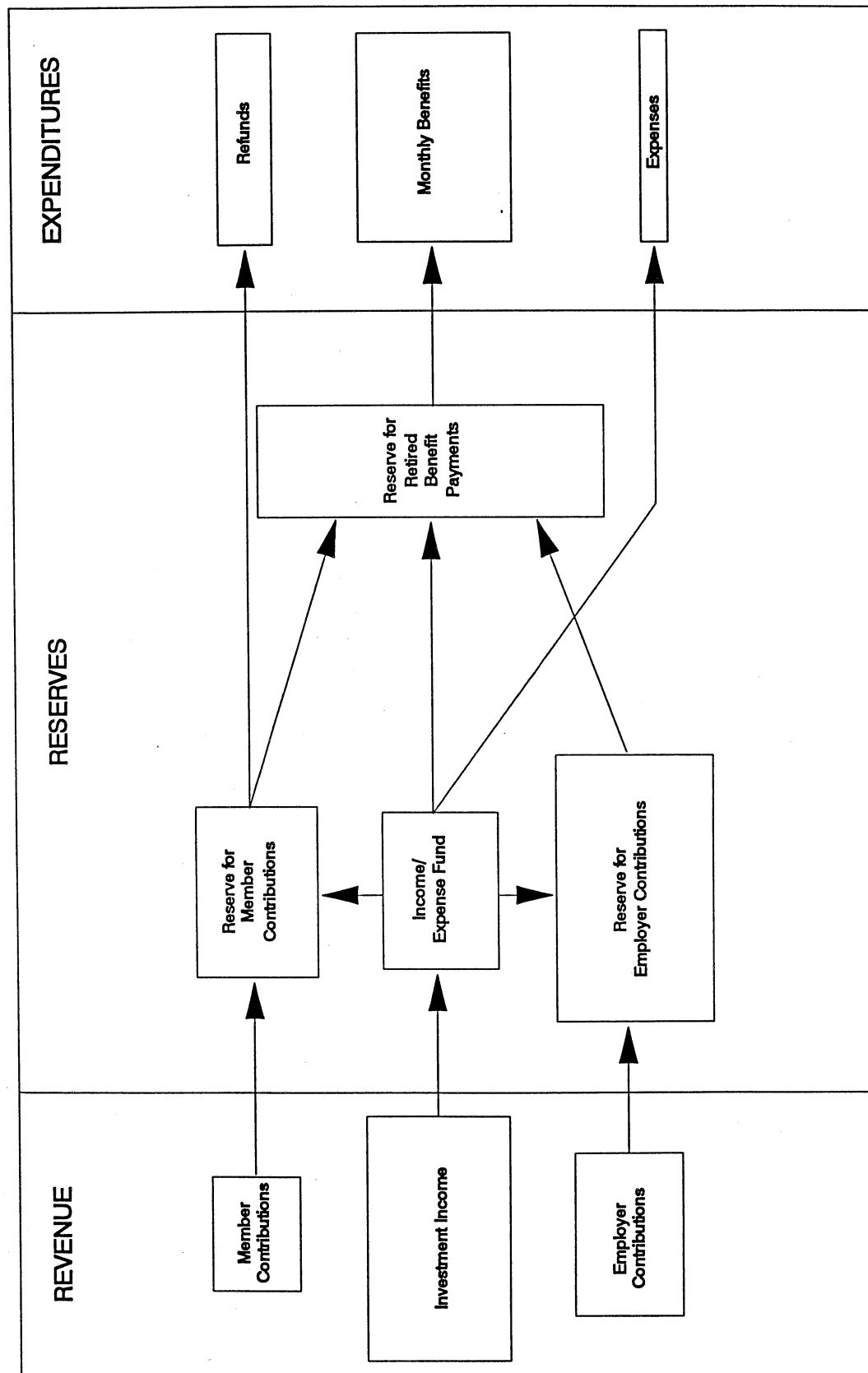
Economic Risk Areas

- Rates of investment return
- Rates of pay increase
- Changes in active member group size

Non-Economic Risk Areas

- Ages at actual retirement
- Rates of mortality
- Rates of withdrawal of active members (turnover)
- Rates of disability

Flow of Money Through the Retirement System



GLOSSARY

Actuarial Accrued Liability. The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability."

Accrued Service. The service credited under the plan which was rendered before the date of the actuarial valuation.

Actuarial Assumptions. Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future plan benefits" between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

Actuarial Equivalent. A single amount or series of amounts of equal value to another single amount or series of amounts, computed on the basis of the rate(s) of interest and mortality tables used by the plan.

Actuarial Present Value. The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Amortization. Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

Experience Gain (Loss). A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

Normal Cost. The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost." Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

Plan Termination Liability. The actuarial present value of future plan benefits based on the assumption that there will be no further accruals for future service and salary. The termination liability will generally be less than the liabilities computed on a "going concern" basis and is not normally determined in a routine actuarial valuation.

Reserve Account. An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability."

Valuation Assets. The value of current plan assets recognized for valuation purposes. Generally based on book value plus a portion of unrealized appreciation or depreciation.

MEANING OF "UNFUNDED ACTUARIAL ACCRUED LIABILITIES"

"Actuarial accrued liabilities" are *the portion of the present value of plan promises to pay benefits in the future not covered by future normal cost contributions*. A liability has been established ("accrued") because service has been rendered, but the resulting monthly cash benefit may not be payable until years in the future. Actuarial accrued liabilities are the results of complex mathematical calculations, which are made annually by the plan's actuary.

If "actuarial accrued liabilities" at any time exceed the plan's accrued assets, the difference is *"unfunded actuarial accrued liabilities."* This is the common condition. If the plan's assets equaled the plan's "actuarial accrued liabilities," the plan would be termed "fully funded." This is an unusual condition.

Each time a plan adds a new benefit which applies to service already rendered, an "actuarial accrued liability" is created, which is also an "unfunded actuarial accrued liability" because assets do not immediately increase to cover the value of the new benefit promises. Payment for such unfunded actuarial accrued liabilities is spread over a period of years, commonly in the 20-40 year range.

Unfunded actuarial accrued liabilities can occur in another way: if actual experience is less favorable than assumed experience, the difference is added to unfunded actuarial accrued liabilities. For example, in plans where benefits are directly related to pay near time of retirement, unfunded actuarial accrued liabilities increase when unexpected rates of pay increase create additional actuarial accrued liabilities which are not offset by higher than assumed investment income. Most unexpected pay increases are the direct result of inflation, which is a very destructive force affecting financial stability.

The existence of unfunded actuarial accrued liabilities is not a cause for concern, but the changes from year to year in amount of unfunded actuarial accrued liabilities are important.

Nor are unfunded actuarial accrued liabilities a bill payable immediately. However, it is important that policy-makers prevent the amount from becoming unreasonably high and *it is vital for a plan to have a sound method for making payments toward them* so that they are controlled.
