# ARKANSAS TEACHER RETIREMENT SYSTEM
## Annual Actuarial Valuation of Active and Inactive Members

## June 30, 2003

GABRIEL, ROEDER, SMITH & COMPANY

# REPORT OF THE JUNE 30, 2003 ACTUARIAL VALUATION
# OUTLINE OF CONTENTS

February 10, 2004

Board of Trustees
Arkansas Teacher Retirement System
Little Rock, Arkansas

***The results of the annual actuarial valuation of non-retired members as of June 30, 2003 are presented in this report.*** This valuation is based upon the Arkansas Teacher Retirement System laws, as described in Section C of this report.

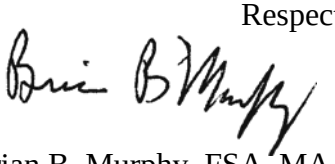
***The census and financial operations data*** necessary for the actuarial valuation were furnished by the Retirement System. Preparation of this data requires considerable staff time. The helpful cooperation of the Executive Director and his staff in furnishing the data is acknowledged with appreciation.

***Liabilities Covering Retirees and Beneficiaries***. The June 30 annual valuation of retired lives receiving monthly benefits indicates the liabilities for future benefit payments to these people. These liabilities are covered in a separate report.

***The actuarial assumptions*** used in the actuarial valuation are summarized in the Appendix of this report. These assumptions reflect experience during the period July 1, 1997 to June 30, 2002.

The valuation was completed using generally accepted actuarial principles and in accordance with standards of practice prescribed by the Actuarial Standards Board. To the best of our knowledge, this report is complete and accurate and the methods and assumptions produced results which are reasonable.

Respectfully submitted,



Brian B. Murphy, FSA, MAAA  Judith A. Kermans, EA, MAAA

BBM/RGS/TCB

# COMMENTS

***General Financial Objective***. Section 24-3-103 of the Arkansas Code provides as follows (emphasis added):

> "6.01. (1) The general financial objective of each Arkansas public employee retirement plan shall be to ***establish and receive contributions which, expressed as percents of active member payroll, will remain approximately level from generation to generation of Arkansas citizens***. More specifically, contributions received each year shall be sufficient both to (i) fully cover the costs of benefit commitments being made to members for their service being rendered in such year and (ii) make a level payment which if paid annually over a reasonable period of future years will fully cover the unfunded costs of benefit commitments for service previously rendered....."

***Teacher Retirement System Status***. Based upon the results of June 30, 2003 actuarial valuations, ***TRS is satisfying the financial objective of level-contribution-percent financing.***

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***This valuation reflects the following changes:***

**Act 991 of 2003**

Full reduction for TDROP beyond age 65 and 30 years of service for future TDROP participants.

**Act 992 of 2003**

Full Employer Contribution for all people who enter TDROP in the future. 12% Employer Contribution for current TDROP participants is phased in gradually through 2011.

**ATRS Board Policy**

No $75 retiree health subsidy for people in TDROP (but people presently in TDROP can keep past subsidy). Interest on TDROP accounts will be 2% less than the system rate of return, but always between 2% and 6%. Deposits and interest to TDROP stop after 10 years in TDROP.

**Act 742 of 2001**

School Employees in APERS can transfer to ATRS prior to retirement, but must have 5 years of ATRS service to get the $75 retiree health subsidy. All retirees must have 5 years of service in order to get the subsidy.

The Employer rate was increased to 13% for 2003/04 fiscal year, and up to 14% for 2004/05 fiscal year if necessary for 30 years amortization. Employer contributions for 2004/05 and beyond will be made on current salary.

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The amortization period this year is 36 years, a decrease from last year's 38-year period. The amortization period of 36 years is the net result of unfavorable investment experience and the benefit and contribution changes described above. These changes were enacted to reduce the amortization period.

# COMMENTS (CONTINUED)

Remaining unrecognized investment losses from the 2000-2003 market downturn will exert upward pressure on the amortization period for several years. The Board may wish to consider a contribution increase for the 2004/05 period.

The funding value of assets now exceeds the market value by 15%. This means that we have just over $1 Billion in unrecognized losses. The amount of unrecognized losses would have been yet higher except that the ATRS Board decided to accelerate the loss recognition schedule by $150 million in order to level out the effect of the loss recognition in future years. See page D-1 regarding the asset valuation method.

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The Arkansas Teacher Retirement System is 86% funded as of this valuation date, indicating a solid financial position even in the face of disappointing investment markets during the last few years. We were pleased to see that the System did earn a positive return for the year ended June 30, 2003.

# BENEFIT CHANGES DURING RECENT YEARS OF RETIREMENT & RELATED CHANGES IN PURCHASING POWER (1970 $)

| Year Ended June 30 | Increase Beginning of Year | Benefit Dollars in Year* | Inflation (Loss) in Year# | Purchasing Power at Year End | |
|---|---|---|---|---|---|
| | | | | 1970 $ | % of 1970 |
| 1970 | - - - - | $ 5,000 | - - - - | $5,000 | 100% |
| 1971 | $ 75 | 5,075 | (4.5)% | 4,850 | 97% |
| 1972 | 75 | 5,150 | (2.9)% | 4,792 | 96% |
| 1973 | 75 | 5,225 | (5.9)% | 4,587 | 92% |
| 1974 | 1,015 | 6,240 | (11.0)% | 4,941 | 99% |
| 1975 | 474 | 6,714 | (9.3)% | 4,860 | 97% |
| 1976 | 886 | 7,600 | (5.9)% | 5,192 | 104% |
| 1977 | 114 | 7,714 | (6.9)% | 4,931 | 99% |
| 1978 | 114 | 7,828 | (7.4)% | 4,658 | 93% |
| 1979 | 114 | 7,942 | (10.9)% | 4,262 | 85% |
| 1980 | 417 | 8,359 | (14.3)% | 3,922 | 79% |
| 1981 | 118 | 8,477 | (9.6)% | 3,630 | 73% |
| 1982 | 323 | 8,800 | (7.1)% | 3,520 | 70% |
| 1983 | 253 | 9,053 | (2.6)% | 3,530 | 71% |
| 1984 | 725 | 9,778 | (4.2)% | 3,658 | 73% |
| 1985 | 738 | 10,516 | (3.7)% | 3,792 | 76% |
| 1986 | 857 | 11,373 | (1.7)% | 4,030 | 81% |
| 1987 | 331 | 11,704 | (3.7)% | 4,001 | 80% |
| 1988 | 673+ | 12,377 | (3.9)% | 4,070 | 81% |
| 1989 | 847 | 13,224 | (5.1)% | 4,134 | 83% |
| 1990 | 837 | 14,061 | (4.7)% | 4,200 | 84% |
| 1991 | 388 | 14,449 | (4.7)% | 4,122 | 82% |
| 1992 | 1,282 | 15,731 | (3.1)% | 4,354 | 87% |
| 1993 | 1,333 | 17,064 | (3.0)% | 4,585 | 92% |
| 1994 | 1,380 | 18,444 | (2.5)% | 4,835 | 97% |
| 1995 | 510 | 18,954 | (3.0)% | 4,822 | 96% |
| 1996 | 510 | 19,464 | (2.8)% | 4,819 | 96% |
| 1997 | 3,591 | 23,055 | (2.3)% | 5,580 | 112% |
| 1998 | 857 | 23,912 | (1.7)% | 5,692 | 114% |
| 1999 | 2,002 | 25,914 | (2.0)% | 6,050 | 121% |
| 2000 | 1,358 | 27,272 | (3.7)% | 6,141 | 123% |
| 2001 | 1,881 | 29,153 | (3.2)% | 6,355 | 127% |
| 2002 | 1,151 | 30,304 | (1.1)% | 6,536 | 131% |
| 2003 | 801 | 31,105 | (2.1)% | 6,570 | 131% |
| 2004 | 801 | 31,906 | | | |

* *The $5,000 benefit used to begin this schedule is an arbitrary amount. A smaller beginning amount (the 1970 average was less) would show a smaller purchasing power loss, in percent loss.*

\# *Based on Consumer Price Index, All Urban Consumers, United States City Average (June values).*

\+ *For members retired in 1972 & later (members retired in 1970 received a larger percentage increase).*

# BENEFIT CHANGES DURING RECENT YEARS OF RETIREMENT & RELATED CHANGES IN PURCHASING POWER (1980 $)

| Year Ended June 30 | Increase Beginning of Year | Benefit Dollars in Year* | Inflation (Loss) in Year# | Purchasing Power at Year End | |
|---|---|---|---|---|---|
| | | | | 1980 $ | % of 1980 |
| 1980 | - - - - | $ 5,000 | - - - - | $ 5,000 | 100% |
| 1981 | $ 75 | 5,075 | (9.6)% | 4,632 | 93% |
| 1982 | 152 | 5,227 | (7.1)% | 4,456 | 89% |
| 1983 | 152 | 5,379 | (2.6)% | 4,471 | 89% |
| 1984 | 431 | 5,810 | (4.2)% | 4,633 | 93% |
| 1985 | 438 | 6,248 | (3.7)% | 4,802 | 96% |
| 1986 | 509 | 6,757 | (1.7)% | 5,103 | 102% |
| 1987 | 197 | 6,954 | (3.7)% | 5,067 | 101% |
| 1988 | 400 | 7,354 | (3.9)% | 5,154 | 103% |
| 1989 | 503 | 7,857 | (5.1)% | 5,236 | 105% |
| 1990 | 497 | 8,354 | (4.7)% | 5,319 | 106% |
| 1991 | 230 | 8,584 | (4.7)% | 5,220 | 104% |
| 1992 | 762 | 9,346 | (3.1)% | 5,513 | 110% |
| 1993 | 792 | 10,138 | (3.0)% | 5,806 | 116% |
| 1994 | 820 | 10,958 | (2.5)% | 6,123 | 122% |
| 1995 | 303 | 11,261 | (3.0)% | 6,107 | 122% |
| 1996 | 303 | 11,564 | (2.8)% | 6,103 | 122% |
| 1997 | 1,657 | 13,221 | (2.3)% | 6,821 | 136% |
| 1998 | 1,214 | 14,435 | (1.7)% | 7,324 | 146% |
| 1999 | 323 | 14,758 | (2.0)% | 7,344 | 147% |
| 2000 | 1,039 | 15,797 | (3.7)% | 7,583 | 152% |
| 2001 | 1,220 | 17,017 | (3.2)% | 7,907 | 158% |
| 2002 | 672 | 17,689 | (1.1)% | 8,132 | 163% |
| 2003 | 468 | 18,157 | (2.1)% | 8,174 | 163% |
| 2004 | 468 | 18,625 | | | |

* *The $5,000 benefit used to begin this schedule is an arbitrary amount. A smaller beginning amount would show a smaller purchasing power loss, in percent loss.*

\# *Based on Consumer Price Index, All Urban Consumers, United States City Average (June values).*

# BENEFIT CHANGES DURING RECENT YEARS OF RETIREMENT & RELATED CHANGES IN PURCHASING POWER (1990 $)

| Year Ended June 30 | Increase Beginning of Year | Benefit Dollars in Year* | Inflation (Loss) in Year# | Purchasing Power At Year End | |
|---|---|---|---|---|---|
| | | | | 1990 $ | % of 1990 |
| 1990 | - - - - | $ 5,000 | - - - - | $ 5,000 | 100% |
| 1991 | $ 150 | 5,150 | (4.7)% | 4,919 | 98% |
| 1992 | 457 | 5,607 | (3.1)% | 5,195 | 104% |
| 1993 | 475 | 6,082 | (3.0)% | 5,471 | 109% |
| 1994 | 492 | 6,574 | (2.5)% | 5,770 | 115% |
| 1995 | 182 | 6,756 | (3.0)% | 5,755 | 115% |
| 1996 | 182 | 6,938 | (2.8)% | 5,751 | 115% |
| 1997 | 330 | 7,268 | (2.3)% | 5,889 | 118% |
| 1998 | 667 | 7,935 | (1.7)% | 6,324 | 126% |
| 1999 | 177 | 8,112 | (2.0)% | 6,340 | 127% |
| 2000 | 849 | 8,961 | (3.7)% | 6,756 | 135% |
| 2001 | 826 | 9,787 | (3.2)% | 7,143 | 143% |
| 2002 | 387 | 10,174 | (1.1)% | 7,346 | 147% |
| 2003 | 270 | 10,444 | (2.1)% | 7,350 | 147% |
| 2004 | 270 | 10,714 | | | |

* *The $5,000 benefit used to begin this schedule is an arbitrary amount. A smaller beginning amount would show a smaller purchasing power loss, in percent loss.*

\# *Based on Consumer Price Index, All Urban Consumers, United States City Average (June values)*

# SECTION A

## Financial Principles

***Promises Made and To Be Paid For***. As each year is completed, the System, in effect, hands an "IOU" to each member then acquiring a year of service credit. The "IOU" says: "The Arkansas Teacher Retirement System 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 Arkansas at the time the IOU becomes a cash demand?

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The financial objective of the ATRS is that this year's taxpayers contribute the money to cover the IOUs being handed out this year so that ***the employer contribution rate will remain approximately level from generation to generation*** -- our children and our grandchildren will not have to contribute greater percents of pay than we contribute now. This objective was set forth in Act 793 of 1977.

(There are systems which have ***a design for deferring contributions to future taxpayers***, lured by a lower contribution rate now and putting aside the fact that the contribution rate must then relentlessly grow much greater over decades of time -- consume now, and let your children face higher contribution rates after you retire.)

An inevitable byproduct of the level-cost design is the accumulation of reserve assets for decades and the income produced when the assets are invested. ***Investment income*** becomes the ***3rd and largest contributor*** for benefits to employees, and is interlocked with 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:

> Normal Cost (the cost of members' service being rendered this year)
> ... plus ...
> Interest on Unfunded Actuarial Accrued Liabilities (unfunded accrued liabilities are the difference between (i) liabilities for service already rendered and (ii) the accrued assets of the plan).

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

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 pay increases; and the assumed age or ages at actual retirement.

In 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 System 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 accuracy of the various financial assumptions or the skill of the actuary and the precision of the calculations made. The System 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 continual adjustments in financial position.

# THE ACTUARIAL VALUATION PROCESS

***The financing diagram*** on the next page shows the relationship between the two fundamentally different philosophies of paying for retirement benefits: the method where contributions match cash benefit payments (or barely exceed cash benefit payments, as in the Federal Social Security program), and is thus an ***increasing contribution method***; and the ***level contribution method*** which equalizes contributions between the generations.

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***The actuarial valuation*** is the mathematical process by which the level contribution rate is determined, and the flow of activity constituting the valuation may be summarized as follows:

A. ***Census Data***, furnished by plan administrator
   Retired lives now receiving benefits
   Former employees with vested benefits not yet payable
   Active employees

B. + ***Asset data*** (cash & investments), furnished by plan administrator

C. + **Benefit provisions** that establish eligibility and amounts of payments to members

D. + ***Assumptions concerning future financial experiences in various risk areas***, which assumptions are established by the Board of Trustees after consulting with the actuary.

E. + ***The funding method*** for employer contributions (the long-term planned pattern for employer contributions)

F. + ***Mathematically combining the assumptions, the funding method, and the data***

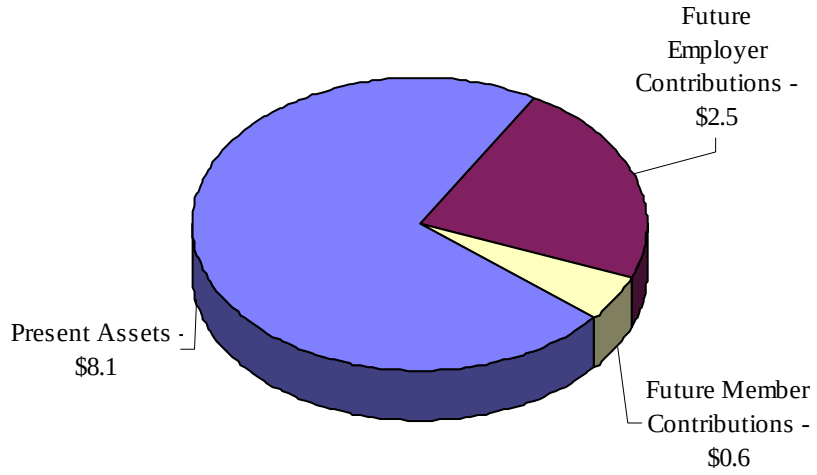
G. = Determination of:
   ***Plan financial position***, and/or
   ***New Employer Contribution Rate***

# SECTION B

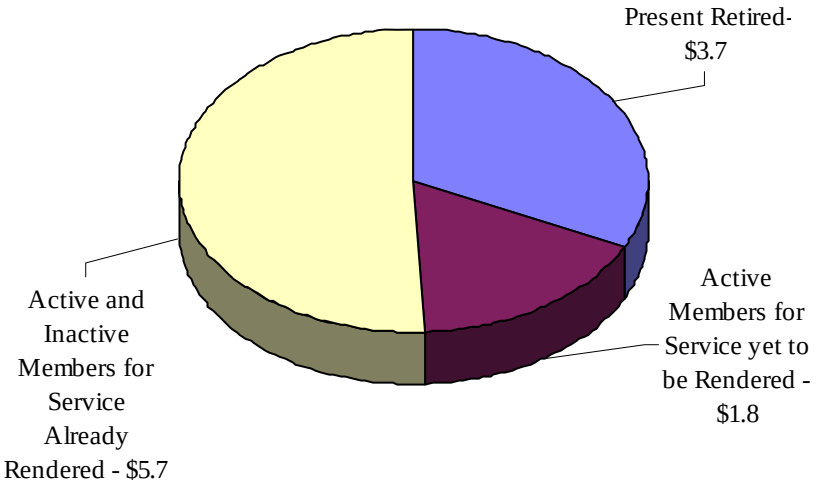
## Results of Valuation

# FINANCING $11.2 BILLION* OF BENEFIT PROMISES FOR PRESENT ACTIVE AND RETIRED MEMBERS JUNE 30, 2003

## Sources of Funds




## Uses of Funds




* *Present value of future benefits. All amounts are in billions.*

# EMPLOYER CONTRIBUTION RATE COMPUTED AS OF JUNE 30, 2003 FOR THE FISCAL YEAR BEGINNING JULY 1, 2004

| Computed Contributions for | Percents of Active Member Full Payroll | | | |
|---|---|---|---|---|
| | Teachers | Support | Combined | Prior Year |
| Normal Cost | | | | |
| Age & Service Annuities | 10.46% | 9.00% | **10.07%** | 10.83% |
| Deferred Annuities | 1.49% | 1.98% | **1.62%** | 1.62% |
| Survivor Benefits | 0.24% | 0.24% | **0.24%** | 0.24% |
| Disability Benefits | 0.66% | 0.59% | **0.64%** | 0.64% |
| Refunds of Member Contributions | 0.33% | 0.56% | **0.39%** | 0.37% |
| Total | 13.18% | 12.37% | **12.96%** | 13.70% |
| Average Member Contributions | 4.27% | 2.86% | **3.90%** | 3.88% |
| Net Employer Normal Cost | 8.91% | 9.51% | **9.06%** | 9.82% |
| Unfunded Actuarial Accrued Liabilities | | | **3.94%** | 2.18% |
| **Employer Contribution Rate** | | | **13.00%** | 12.00% |
| **Amortization Years** | | | **36.0** | 38.0 |

***The length of an amortization period is a matter of judgment***, not a matter of solving an algebraic equation. No one amortization period is "correct" --- there is a range of reasonable judgment. In its pursuit of level-percent contributions, the Teacher Retirement System has used a variety of amortization periods from time to time, extending to 40 years on occasions. This year's result reflects changes in benefits and a contribution rate increase enacted to decrease the amortization period. Experience was poor this year for ATRS, as it was for most plans in the country. As additional unrealized investment losses flow into the valuation over the next several years, the amortization period is likely to increase.

# COMPUTED EMPLOYER CONTRIBUTION RATES
# 10 -YEAR COMPARATIVE STATEMENT

| Valuation Date June 30 | Active Members in Valuation | | Average Annual Pay | | Consumer Price (Inflation) Index | | Employer Contributions | |
|---|---|---|---|---|---|---|---|---|
| | Number | Annual Payroll | Amount | % Change | Value | %Change | Computed Financing Period | Total Employer Rate |
| 1991#* | 45,902 | $ 909 | $ 19,796 | 0.1 % | 136.0 | 4.7 % | 11 | 12.0 % |
| 1992# | 55,688 | 1,077 | 19,338 | (2.3)% | 140.2 | 3.1 % | 30 | 12.0 % |
| 1993# | 58,519 | 1,120 | 19,145 | (1.0)% | 144.4 | 3.0 % | 30 | 12.0 % |
| 1994* | 57,403 | 1,167 | 20,337 | 6.2 % | 148.0 | 2.5 % | 29 | 12.0 % |
| 1995@ | 58,876 | 1,234 | 20,952 | 3.0 % | 152.5 | 3.0 % | 24 | 12.0 % |
| 1996 | 56,100 | 1,260 | 22,463 | 7.2 % | 156.7 | 2.8 % | 16 | 12.0 % |
| 1997# | 56,997 | 1,302 | 22,847 | 1.7 % | 160.3 | 2.3 % | 13 | 12.0 % |
| 1998#*& | 58,528 | 1,368 | 23,380 | 2.3 % | 163.0 | 1.7 % | 12 | 12.0 % |
| 1999# | 59,499 | 1,429 | 24,019 | 2.7 % | 166.2 | 2.0 % | 4 | 12.0 % |
| 2000# | 60,147 | 1,485 | 24,696 | 2.8 % | 172.4 | 3.7 % | 22 | 12.0 % |
| 2000#! | 60,147 | 1,485 | 24,696 | 2.8 % | 172.4 | 3.7 % | 30 | 12.0 % |
| 2001 | 61,389 | 1,557 | 25,365 | 2.7 % | 178.0 | 3.2 % | 125 | 12.0 % |
| 2002& | 62,011 | 1,628 | 26,254 | 3.5 % | 179.9 | 1.1 % | 38 | 12.0 % |
| 2003 | 62,432 | 1,683 | 26,963 | 2.7 % | 183.7 | 2.1 % | 150+ | 12.0 % |
| 2003# | 62,432 | 1,683 | 26,963 | 2.7 % | 183.7 | 2.1 % | 36 | 13.0 % |

* *Revised financial assumptions.*
\# *Legislated benefit or contribution rate changes.*
@ *Revised asset valuation method.*
& *Revised decrement assumptions.*
! *Benefit increases proposed for 2001 and assuming 8% investment return for Fiscal Year Ended 6/30/2001.*

In the Arkansas Teacher Retirement System, the Change in Average pay statistic has been affected by the influx of new non-teaching support employees. This influx has been a contributing factor to the growth of the active member population in recent years.

# LIABILITIES FOR ANNUITIES BEING PAID JULY 1, 2003
# TABULATED BY TYPE OF ANNUITY BEING PAID

| Type of Annuity | Liabilities July 1, 2003* | | |
|---|---|---|---|
| | Men | Women | Totals |
| RETIREMENT RESERVE ACCOUNT | | | |
| Age & Service Annuities | | | |
| Option 1 (Straight Life) | $577,538,917 | $1,938,538,678 | $2,516,077,595 |
| Option A (100% Joint & Survivor) | 225,446,523 | 117,729,135 | 343,175,658 |
| Option B ( 50% Joint & Survivor) | 168,192,454 | 126,275,262 | 294,467,716 |
| Option C (10 Years Certain & Life) | 35,575,732 | 59,768,914 | 95,344,646 |
| Beneficiaries | 10,189,396 | 44,608,410 | 54,797,806 |
| Total Age & Service | 1,016,943,022 | 2,286,920,399 | 3,303,863,421 |
| Disability Annuities | | | |
| Option 1 | $30,813,549 | $136,955,285 | 167,768,834 |
| Option A | $12,393,283 | $13,743,378 | 26,136,661 |
| Option B | $3,487,518 | $5,192,756 | 8,680,274 |
| Option C | $1,090,305 | $4,128,931 | 5,219,236 |
| Beneficiaries | $10,499,482 | $14,056,334 | 24,555,816 |
| Total Disability | 58,284,137 | 174,076,684 | 232,360,821 |
| Act 793 | | | 17,022,589 |
| Total Retirement Reserve Account | | | 3,553,246,831 |
| SURVIVORS' BENEFIT ACCOUNT | | | |
| Beneficiaries of Deceased Members | $19,194,190 | $33,960,199 | 53,154,389 |
| OTHER LIABILITIES | | | |
| Act 808 | | | 34,228,384 |
| RETIREMENT SYSTEM TOTALS | | | |
| Total Annuity Liabilities | | | $3,640,629,604 |

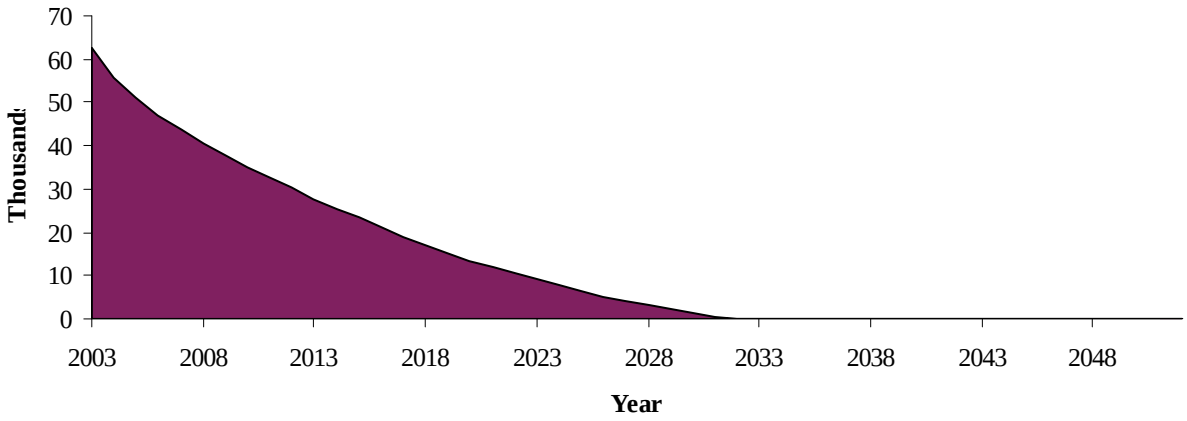
* *Does not include liabilities associated with lump sum death benefit.*

# COMPUTED ACTUARIAL LIABILITIES
# AS OF JUNE 30, 2003

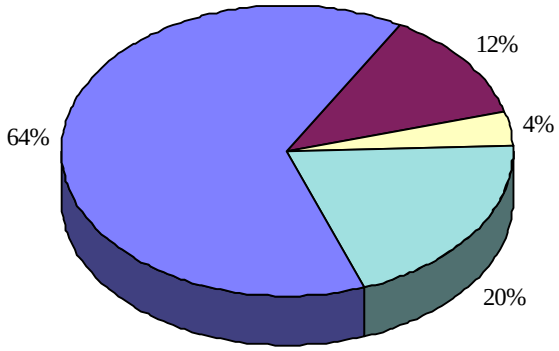
| Actuarial Present Value of | (1) Total Present Value | Entry Age Actuarial Cost Method (2) Portion Covered By Future Normal Cost Contributions | Entry Age Actuarial Cost Method (3) Actuarial Accrued Liabilities (1)-(2) |
|---|---|---|---|
| Age and service retirement and T-Drop allowances based on Total service likely to be rendered by present active and T-Drop members | $6,635,034,858 | $1,390,692,546 | $5,244,342,312 |
| Vested Deferred Benefits likely to be paid present active and inactive members | 595,610,400 | 232,338,408 | 363,271,992 |
| Survivor benefits expected to be paid on behalf of present active members. | 72,842,689 | 32,781,373 | 40,061,316 |
| Disability Benefits expected to be paid on behalf of present active members | 175,427,687 | 90,995,863 | 84,431,824 |
| Refunds of Member contributions expected to be paid on behalf of Present active members | 10,944,050 | 52,942,637 | (41,998,587) |
| Benefits payable to present retirees and beneficiaries | 3,640,629,604 | 0 | 3,640,629,604 |
| Lump Sum Death benefits payable to present retirees and beneficiaries | 65,129,006 | 0 | 65,129,006 |
| Load for subsidized options, service purchases and members who transfer to ATRS | 49,067,598 | 0 | 49,067,598 |
| Total | $11,244,685,892 | $1,799,750,827 | $9,444,935,065 |
| Applicable Assets | 8,113,258,915 | 0 | 8,113,258,915 |

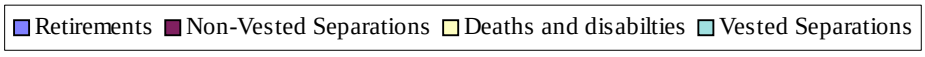
# EXPECTED DEVELOPMENT OF PRESENT POPULATION
# JUNE 30, 2003

## Closed Group Population Projection



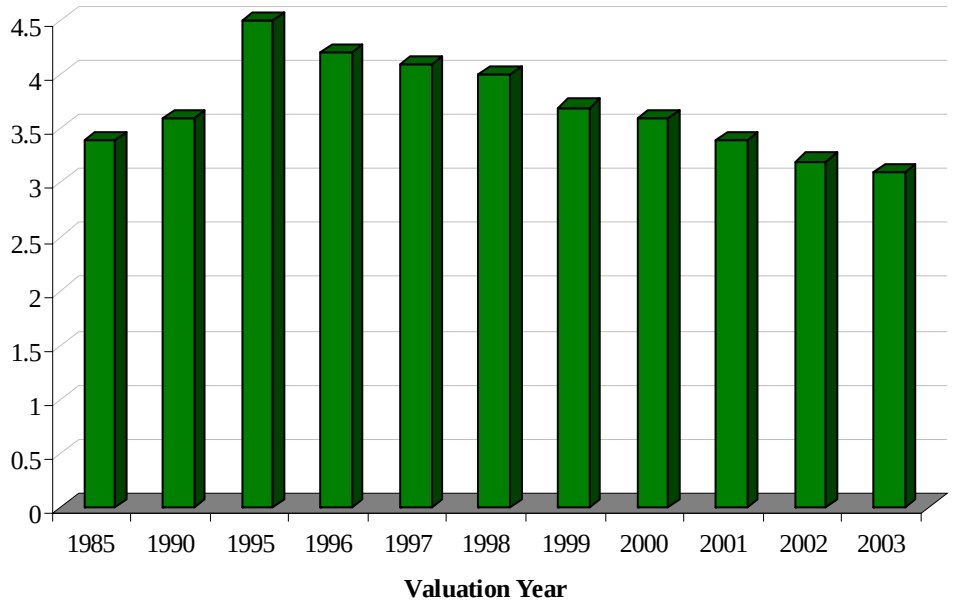

## Closed Group Population Projection



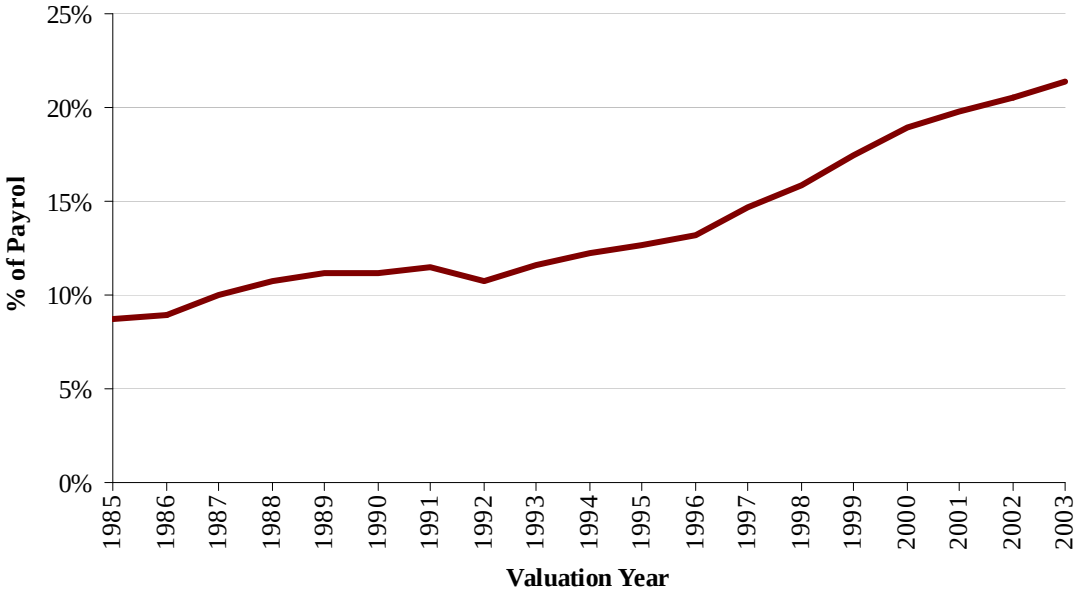




The charts show the expected future development of the present population in simplified terms. The retirement system presently covers 62,432 active members. Eventually, 12% of the population is expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. Approximately 84% of the present population is expected to receive monthly retirement benefits either by retiring directly from active service, retiring from T-Drop, or retiring from vested deferred status. 4% of the present population is expected to become eligible for death-in-service or disability benefits. Within 10 years, over half of the covered membership is expected to consist of new hires.

## Active Members Per Retired Life




## Retirement Benefits Being Paid as a Percent of Member Payroll



# SHORT CONDITION TEST

The TRS funding objective is to meet long term benefit promises through contributions that remain approximately level from year to year as a percent of member payroll. If the contributions to the System are level in concept and soundly executed, the System will ***pay all promised benefits when due -- the ultimate test of financial soundness***. Testing for level contribution rates is ***the*** long term test.

***A short condition test*** is one means of checking a system's progress under its funding program. In a short condition test, the plan's present assets (cash and investments) are compared with: 1) Member contributions on deposit; 2) The liabilities for future benefits to present retired lives; 3) The liabilities for service already rendered by members. In a system that has been following the discipline of level percent of payroll financing, the liabilities for member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by members (liability 3) will be partially covered by the remainder of present assets. The larger the funded portion of liability 3, the stronger the condition of the system. Liability 3 being fully funded is unusual.

The schedule below illustrates the history of liability 3 of the System and is indicative of the TRS objective of following the discipline of level percent of payroll financing.

| Val. Date June 30 | (1) Member Contrb. | (2) Retirees and Benef. | (3) Active and Inactive Members (Employer Financed Portion) | Present Valuation Assets | Portion of Present Values Covered by Present Assets | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | (1) | (2) | (3) | Total |
| | | ----------$ Millions---------- | | | | | | |
| 1991#* | $ 344 | $ 985 | $1,433 | $ 2,434 | 100% | 100% | 77% | 88% |
| 1992# | 367 | 1,077 | 1,885 | 2,729 | 100% | 100% | 68% | 82% |
| 1993# | 388 | 1,207 | 2,117 | 3,051 | 100% | 100% | 69% | 82% |
| 1994 | 403 | 1,334 | 2,223 | 3,307 | 100% | 100% | 71% | 84% |
| 1995* | 415 | 1,488 | 2,354 | 3,626 | 100% | 100% | 73% | 85% |
| 1996 | 424 | 1,634 | 2,577 | 4,186 | 100% | 100% | 83% | 90% |
| 1997# | 426 | 1,918 | 3,059 | 4,956 | 100% | 100% | 85% | 92% |
| 1998# | 435 | 2,173 | 3,553 | 5,815 | 100% | 100% | 90% | 94% |
| 1999# | 447 | 2,566 | 3,821 | 6,740 | 100% | 100% | 98% | 99% |
| 2000 | 454 | 2,804 | 4,322 | 7,620 | 100% | 100% | 101% | 101% |
| 2000# | 454 | 2,888 | 4,537 | 7,620 | 100% | 100% | 94% | 97% |
| 2001# | 470 | 3,200 | 4,891 | 8,166 | 100% | 100% | 92% | 95% |
| 2002* | 490 | 3,441 | 5,131 | 8,328 | 100% | 100% | 86% | 92% |
| 2003 | 521 | 3,706 | 5,445 | 8,263 | 100% | 100% | 74% | 85% |
| 2003# | 521 | 3,706 | 5,218 | 8,113 | 100% | 100% | 74% | 86% |

* *Revised actuarial assumptions or methods.*

\# *Legislated benefit and contribution rate change.*

# SECTION C

## Summary of Benefits

1. **Voluntary Retirement.** A member may retire at age 60 with 5 or more years of credited service, or after 28 years of credited service regardless of age.

2. **Early Retirement.** A member who has more than 25 but less than 28 years of credited service and has not attained age 60 years may retire and receive an immediate early retirement annuity. The early annuity is an age & service annuity reduced by the lesser of (i) and (ii) below:

   (i) 5/12 of 1% multiplied by the number of months by which early retirement precedes completion of 28 years of service or

   (ii) 5/12 of 1% multiplied by the number of months by which early retirement precedes the attainment of age 60 years.

3. **Deferred Retirement.** An inactive member who has 5 or more years of credited service will be entitled to an age & service annuity beginning at age 60, provided accumulated contributions are left on deposit with the retirement system.

4. **Disability Retirement.** An active member, with 5 or more years of credited service, who becomes totally and permanently disabled may be retired and receive a disability annuity computed in the same manner as an age & service annuity.

5. **Final Average Salary (FAS).** A member's final average salary is the average of the annual salaries paid during the period of 3 years of credited service producing the highest annual average.

6. **Age & Service Annuity and Disability Annuity.** The annuity payable will not be less than the total of: years of contributory service times 2.15% of FAS; plus years of non-contributory service times 1.39% of FAS; plus $900 for all members with 5 or more years of ATRS credited service. For a member who elected to contribute on only the first $7,800 of each annual salary after June 30, 1969, each annual salary used in computing FAS is limited to a maximum of $7,800.

7. **Minimum Straight Life Annuity.** If a contributory member has 5 or more years of credited service, the straight life annuity will not be less than $100 per month. The minimum benefit for a non-contributory member is $64 per month. If a contributory member has 10 or more

years of credited service, the straight life annuity will not be less than $150 per month. The minimum benefit for a non-contributory member is $44 per month.

7. **T-Drop.** A member with 28 or more years of service may participate in the Teacher Deferred Retirement Option Plan (T-Drop, Act 1096 of 1995). An amount equal to the amount that would have been paid had the member retired, reduced by 1% for each year of contributory and 6/10% for each year of non-contributory service, is deposited into a T-Drop account. Members who enter T-Drop with less than 30 years of service are subject to an additional 6% reduction for each year less than 30 years. The annual addition to the T-Drop account is increased each year by 3% of the member's annuity at the initial participation date and the account is credited with 2% less than the system's rate of return (but not less than 2%, nor greater than 6% interest on the mean balance) each year. Deposits and interest to T-Drop cease at the earlier of 10 years of T-Drop participation or separation from service. T-Drop participants may continue in covered employment after 10 years of participation, but do not accumulate additional service credit or make member contributions. Upon actual retirement the member may receive the T-Drop account balance in the form of a lump sum or as an additional annuity.

8. **Post-Retirement Increases.** Each July 1, every member's annuity is adjusted to be equal to the base annuity times 100% plus 3% for each full year in the period from the effective date of the base annuity to the current July 1. The base annuity is the amount of the member's annuity on the later of April 1, 1997 or the effective date of retirement, as redetermined by Acts 396 and 992.

9. **Survivor Benefits.** Upon the death of an active member, who has 5 or more years of credited service (which includes the year immediately preceding his death), the following annuities are payable:

   (a) The surviving spouse receives an annuity computed in the same manner as if the member had (i) retired the date of his death with entitlement to an annuity, (ii) elected Option A - 100% Survivor Annuity, and (iii) nominated the spouse as joint beneficiary. If the member has attained age 60 and has acquired 10 years of credited service or has acquired 20 years of credited service regardless of age, the annuity begins immediately; or, if the member has acquired 15 years of credited service but has not attained age 60, the annuity begins when the spouse is 50; otherwise the annuity begins at age 62. The spouse's annuity cannot be less than

the greater of (i) 10% of the deceased member's covered salary at time of death or (ii) $50 monthly. Under certain circumstances, a lump sum distribution may be made to the beneficiary(ies) of the deceased member.

(b) Each dependent child receives an annuity of the greater of (i) 10% of covered salary at the time of death or (ii) $50 monthly; provided, that if there are 3 or more dependent children, each receives an annuity of an equal share of the greater of (i) 25% of covered salary at time of death or (ii) $125 monthly. A child is dependent until the child's death, marriage, or attainment of age 18 (age 23 if the child is a full-time student).

(c) If there is neither a spouse nor a dependent child at the time of the member's death, each dependent parent receives an allowance of the greater of (i) 10% of covered salary or (ii) $50 monthly.

(d) Survivor benefits based on both contributory and non-contributory service will be prorated between contributory benefits and non-contributory benefits.

11. **Lump Sum Death Benefit.** Beneficiaries of deceased:

1. Active Members or
2. Retirees with 5 or more years of ATRS credited service are eligible to receive a lump sum death benefit of up to $10,000 ($6,667 for non-contributory service -benefit is prorated). In addition, each dependent child of a deceased member with 5 or more years of ATRS credited service is eligible to receive a lump sum death benefit of $10,000.

12. **Members' Contributions.** Members contribute 6% of their salaries (by individual election, members who became members before July 1, 1971 could contribute on only the first $7,800 of their annual salaries). If a member leaves service prior to becoming eligible to retire, the accumulated contributions are returned upon request. No interest is credited to a member's contributions for the first year of membership; after 1 year, interest credits are 6% annually. Effective July 1, 1993, a non-contributory plan was created and all new members including any former active members were automatically non-contributory members. By individual election, members could choose to contribute. The benefit accrual rate for non-contributory members is reduced. Effective 7/1/1999 the default choice for new members is contributory. All current members had until 7/1/2000 to make a final election. Effective July 1, 1997, all future member

contributions are tax-deferred in accordance with §414(h) of the Internal Revenue Code of the United States.

12. **Act 808 Retirement.** Any employee of a state agency who was an active member of the Arkansas Teacher Retirement System on April 8, 1987, and who qualified for retirement before January 1, 1988, could become a member of the Arkansas Public Employees Retirement System and retire from that system. All credited service was transferred to that system but the member's contributions were retained by the Arkansas Teacher Retirement System and the benefit amount is transferred monthly to the Arkansas Public Employees Retirement System.

13. **Act 793 Retirement.** Any employee who was a member of the rehabilitation services in 1977 was permitted to become a member of the Arkansas Public Employees Retirement System. Liabilities associated with prior service earned through 6/30/1978 remain in the Arkansas Teacher Retirement System. Future service is allocated to the Arkansas Public Employees Retirement System.

14. **Retiree Health Stipend.** Each retired member with 5 or more years of ATRS credited service receives $75 per month toward retiree health care premiums. Members in T-DROP do not receive the $75 per month, until actual retirement.

# SAMPLE BENEFIT COMPUTATIONS FOR A MEMBER RETIRING JUNE 30, 2003

The data for the Example member is shown below.

| | | |
|---|---|---|
| A. | $35,000 | Final Average Compensation |
| B. | 32 | Total Service Credit |
| C. | 27 | Contributory Service Credit |
| D. | 60 | Age of Retiree |
| E. | 55 | Age of Spouse |
| F. | 100% | Percentage of Retirement Allowance to Continue to Spouse after Retiree's Death (Retiree Chooses this Percentage) |

The computations that would be made for this case are:

| | | | **Annual Amount** |
|---|---|---|---|
| G. | Non-Contributory Base: | 0.0139 x A x B | $15,568 |
| H. | Extra for Contributory: | 0.00760 x A x C | 7,182 |
| I. | Total Benefit: G + H | | 22,750 |
| J. | Adjustment for Line F election: (1 - 0.83037) x I | | 3,859 |
| K. | Annual Amount Payable | | $18,891 |

Projected Benefits, taking into account increases after retirement would be:

| **Year Ended June 30** | **Amount Paid** |
|---|---|
| 2004 | $18,891 |
| 2005 | 19,458 |
| 2006 | 20,025 |
| 2007 | 20,592 |
| 2008 | 21,159 |

Thereafter, the amount would increase by $567 annually for life.

# SAMPLE T-DROP BENEFIT COMPUTATIONS FOR A MEMBER ENTERING T-DROP JUNE 30, 2003

The data for the Example member is shown below.

| | | |
|---|---|---|
| A. | $35,000 | Final Average Compensation |
| B. | 28 | Total Service Credit |
| C. | 28 | Contributory Service Credit |
| D. | 55 | Age of Retiree |

The computations that would be made for this case are:

| | | Annual Amount |
|---|---|---|
| E. | Non-Contributory Base: 0.0139 x A x B | $13,622 |
| F. | Extra for Contributory: 0.00760 x A x C | 7,448 |
| G. | Reduction for T-DROP Plan: (1% for each year of contributory service) 0.28 x (E+F) | 5,900 |
| H. | Reduction for Entering T-DROP with less than 30 years of service (6% for each year less than 30): 0.12 x (E + F) | 2,528 |
| I. | Annual Amount Payable E + F – G – H | $12,642 |

Projected Deposits, taking into account increases after DROP, and 5 years duration would be:

| Year Ended June 30 | Amount Deposited |
|---|---|
| 2004 | $12,642 |
| 2005 | 13,021 |
| 2006 | 13,400 |
| 2007 | 13,779 |
| 2008 | 14,158 |
| Total | 67,000 |

The total amount deposited, together with credited interest can be paid as a lump sum or as an annuity.

# SECTION D

## Financial Information and GASB Reporting

# ARKANSAS TEACHER RETIREMENT SYSTEM
# ASSET VALUATION METHOD

An essential step in the valuation process is comparing valuation assets with computed liabilities. Valuation assets are those assets that are recognized for funding purposes.

Asset valuation methods are distinguished by the timing of the recognition of investment income. Total investment income is the sum of ordinary income and capital value changes. Under a pure market value approach, ordinary investment income and all capital value changes would be recognized immediately. Because of market volatility, use of pure market values in retirement funding can result in volatile contribution rates and unstable financial ratios, contrary to ATRS objectives.

Under the ATRS asset valuation method (see page D-2), assumed investment return is recognized fully each year. Differences between actual and assumed investment return are phased in over a closed 4-year period. During periods when investment performance exceeds the assumed rate, the funding value will tend to be less than the market value. Conversely, during periods when investment performance is less than the assumed rate, funding value will tend to be greater than market value. If assumed rates are exactly realized for 3 consecutive years, funding value will become equal to market value.

A multi-year comparison of market value to funding (actuarial) value is shown below:

| Valuation Date June 30 | Market Value of (1) | Actuarial Value of Assets (2) | Ratio of AV to MV (2) / (1) |
|---|---|---|---|
| 1995 | $4,000 | $3,626 | 91% |
| 1996 | 4,750 | 4,186 | 88% |
| 1997 | 5,747 | 4,956 | 86% |
| 1998 | 6,656 | 5,815 | 87% |
| 1999 | 7,403 | 6,740 | 91% |
| 2000 | 7,978 | 7,620 | 96% |
| 2001 | 7,643 | 8,166 | 107% |
| 2002 | 7,084 | 8,328 | 118% |
| 2003 | 7,050 | 8,113 | 115% |

The funding value of assets now exceeds the market value by 15%. Present market conditions can lead to a situation where the recognized assets might deviate greatly from the market value. To prevent this, there is a requirement that the recognized assets must always be between 80% and 120% of the market value (See page D-2).

# DEVELOPMENT OF FUNDING VALUE OF ASSETS

| Year Ended June 30: | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|
| A. Funding Value Beginning of Year | $7,619,736,770 | $8,166,235,989 | $8,328,451,257 | | | |
| B. Market Value End of Year | 7,642,865,577 | 7,084,325,012 | 7,050,355,544 | | | |
| C. Market Value Beginning of Year | 7,978,068,238 | 7,642,865,577 | 7,084,325,012 | | | |
| D. Non-Investment Net Cash Flow | (76,534,107) | (94,448,106) | (109,466,730) | | | |
| E. Investment Return | | | | | | |
| E1. Market Total: B - C - D | (258,668,554) | (464,092,459) | 75,497,262 | | | |
| E2. Amount for Immediate Recognition (8%) | 606,517,577 | 649,520,955 | 661,897,431 | | | |
| E3. Amount for Phased-In Recognition: E1-E2 | (865,186,131) | (1,113,613,414) | (586,400,169) | | | |
| F. Phased-In Recognition of Investment Return | | | | | | |
| F1. Current Year: 0.25 x E3 | (216,296,533) | (278,403,354) | (146,600,042) | Unknown | Unknown | Unknown |
| F2. First Prior Year | 23,676,886 | (216,296,533) | (278,403,354) | $ (354,301,124) | Unknown | Unknown |
| F3. Second Prior Year | 78,165,420 | 23,676,886 | (216,296,533) | | $ (354,301,124) | Unknown |
| F4. Third Prior Year | 130,969,976 | 78,165,420 | 23,676,886 | | | $ (354,301,123) |
| F5. Accelerated Market Value Recognition | | | (150,000,000) | | | |
| **F6. Total Recognized Investment Gain** | **16,515,749** | **(392,857,581)** | **(767,623,043)** | **(354,301,124)** | **(354,301,124)** | **(354,301,123)** |
| **G. Funding Value End of Year:** | | | | | | |
| G1. Preliminary Funding Value End of Year: A+D+E2+F5 | **8,166,235,989** | **8,328,451,257** | **8,113,258,915** | | | |
| G2. Upper Corridor Limit: 120% x B | | **8,501,190,014** | **8,460,426,653** | | | |
| G3. Lower Corridor Limit: 80% x B | | **5,667,460,010** | **5,640,284,435** | | | |
| **G4. Funding Value End of Year** | | **8,328,451,257** | **8,113,258,915** | | | |
| H. Actual/Projected Difference between Market and Funding Value | (523,370,412) | (1,244,126,245) | (1,062,903,371) | (708,602,247) | (354,301,123) | - |
| I. Market Rate of Return | (3.26)% | (6.11)% | 1.07 % | | | |
| J. Funding Rate of Return | 8.22 % | 3.16 % | (1.28)% | | | |
| K. Ratio of Funding Value to Market Value | 107% | 118% | 115% | | | |

The Funding Value of Assets recognizes assumed investment return (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 assumed rates are exactly realized for 3 consecutive years, it will become equal to Market Value.

***The assets*** of the Retirement System, as of June 30, 2003, were reported to your actuary to be $7,050,355,544. This amount, together with a market value adjustment of $1,062,903,371, is used to finance the Retirement System liability.

| Accounts | Assets at June 30 | |
|---|---|---|
| | 2003 | 2002 |
| Regular Accounts | | |
| Members' Deposit Accounts | | |
| Contributions | $ 495,769,322 | $ 471,697,235 |
| Interest | 3,395,910,455 | 3,583,501,829 |
| Total | 3,891,679,777 | 4,055,199,064 |
| T-Drop Member Deposit Accounts | | |
| Contributions | 25,184,682 | 18,515,453 |
| Interest | 66,480,258 | 65,388,014 |
| Total | 91,664,940 | 83,903,467 |
| Employer's Accumulation Account | (800,017,559) | (182,362,214) |
| Retirement Reserve Account | 3,497,098,954 | 2,828,171,224 |
| Act 808 Retirement Reserve Account | 33,648,262 | 30,090,305 |
| T-Lump Payable | 263,673,161 | 207,017,273 |
| Survivors Benefit Account | 50,835,629 | 40,558,294 |
| Total Regular Accounts | 7,028,583,164 | 7,062,577,413 |
| Other Accounts | | |
| Income Expense Account | 21,772,380 | 21,747,599 |
| Other Special Reserves | 0 | 0 |
| Miscellaneous | 0 | 0 |
| Total Other Accounts | 21,772,380 | 21,747,599 |
| Total Accounting Value of Assets | 7,050,355,544 | 7,084,325,012 |
| Market Value Adjustment | 1,062,903,371 | 1,244,126,245 |
| Funding Value of Assets | $8,113,258,915 | $8,328,451,257 |

In financing the Retirement System Accrued Liabilities, the applicable assets have been applied as follows.

| | Assets Applied to Accrued Liabilities for | | | |
|---|---|---|---|---|
| | **Retirees and Beneficiaries** | **Active and Inactive Members** | **T-Drop Members** | **Totals** |
| Reserve Assets | | | | |
| Member's Deposit Account | $ 0 | $3,891,679,777 | $ 91,664,940 | $3,983,344,717 |
| Employer's Accumulation Account | 124,175,765 | (2,141,370,395) | 1,217,177,071 | (800,017,559) |
| Retirement Reserve Account | 3,497,098,954 | 0 | 0 | 3,497,098,954 |
| Act 808 Reserve Account | 33,648,262 | 0 | 0 | 33,648,262 |
| T-Lump Payable | 0 | 0 | 263,673,161 | 263,673,161 |
| Survivor's Benefit Account | 50,835,629 | 0 | 0 | 50,835,629 |
| Other Accounts | 0 | 21,772,380 | 0 | 21,772,380 |
| Total Reserve Assets | 3,705,758,610 | 1,772,081,762 | 1,572,515,172 | 7,050,355,544 |
| Market Value Adjustment | 0 | 1,062,903,371 | 0 | 1,062,903,371 |
| Funding Value of Assets | $3,705,758,610 | $2,834,985,133 | $1,572,515,172 | $8,113,258,915 |

The net market value of assets at year end was $7,050,355,544 and was invested as shown below.

| | Market Value at June 30 | |
|---|---|---|
| | **2003** | **2002** |
| Cash | $ 10,900,430 | $ 7,911,235 |
| Receivables | | |
| Unsettled Trades and Accrued Return | 187,445,230 | 329,658,790 |
| Member Contributions | 9,178,970 | 8,476,251 |
| Employer Contributions | 5,589,204 | 5,450,173 |
| Other | 27,611 | 303 |
| Total Receivables | 202,241,015 | 343,585,517 |
| Investments | | |
| Short Term | 0 | 0 |
| Common and Preferred | 3,505,161,180 | 3,868,313,245 |
| International | 986,774,693 | 891,824,907 |
| Corporate Bonds | 509,438,403 | 525,953,219 |
| Alternative Investments | 1,103,359,264 | 948,919,262 |
| Market Valuation | 314,374,242 | (132,712,441) |
| Real Estate | 140,775,617 | 127,616,281 |
| Mortgage Loans | 203,724,144 | 243,777,265 |
| Revenue Bonds | 1,005,000 | 1,285,000 |
| Government Securities | 345,442,721 | 491,101,500 |
| Other Investments | 123,712,690 | 140,439,591 |
| Repurchase Agreements | 0 | 0 |
| Total Investments | 7,233,767,954 | 7,106,517,829 |
| Invested Securities Lending | 717,697,826 | 607,789,389 |
| Net Equipment | 3,553,270 | 2,609,293 |
| Total Assets | 8,168,160,495 | 8,068,413,263 |
| Liabilities | | |
| Escrow Payables | 5,638 | 82,990 |
| Other Payables | 1,177,483 | 1,150,535 |
| Securities Related Payables | 398,924,004 | 375,065,337 |
| Securities Lending Collateral | 717,697,826 | 607,789,389 |
| Total Liabilities | 1,117,804,951 | 984,088,251 |
| Net Market Value | 7,050,355,544 | 7,084,325,012 |
| Change from Prior Year | (33,969,468) | (558,540,565) |

Assets during the year developed as follows:

## MARKET VALUE RECONCILIATION OF ASSETS

| | Year Ended June 30 | |
|---|---|---|
| | **2003** | **2002** |
| Net Market Value July 1 | $7,084,325,012 | $7,642,865,577 |
| Additions | | |
| Employer Contributions | 200,455,916 | 191,352,911 |
| Employee Contribs | 76,734,478 | 71,893,349 |
| Appreciation | 447,086,682 | (421,135,230) |
| Interest | 5,808,737 | 58,170,648 |
| Dividends | (341,857,425) | (65,866,964) |
| Real Estate | 8,251,181 | 6,817,467 |
| Other | 120,839 | 673,597 |
| Securities Lending Activity | 11,211,899 | 4,800,357 |
| Total Additions | 407,812,307 | (153,293,865) |
| Deductions | | |
| Age& Service Benfits | 315,223,934 | 291,969,589 |
| Disability Benefits | 19,800,585 | 18,965,804 |
| Option Benefits | 8,841,345 | 7,947,966 |
| Survivor benefits | 5,497,107 | 5,306,397 |
| Reciprocal Service | 10,243,884 | 8,878,504 |
| Act 808 | 4,272,018 | 4,261,952 |
| Refunds | 3,585,188 | 2,744,685 |
| Active Member Death | 713,094 | 580,689 |
| TDROP Benefits | 18,479,969 | 17,038,780 |
| Investment Expense | 47,162,188 | 40,198,171 |
| Admin. Expenses | 7,962,463 | 7,354,163 |
| Total Deductions | 441,781,775 | 405,246,700 |
| Miscellaneous | 0 | 0 |
| Net Market Value June 30 | $7,050,355,544 | $7,084,325,012 |

# HISTORICAL PATTERNS OF INVESTMENT RETURN, PAY INCREASES & INFLATION

| Calendar Year Period | Gross Market Returns: Bonds (Long) U.S. Treasury | Bonds (Long) Corp. (S&P AA) | Cash Equiv. (T Bills) | Stocks (S&P 500) | Price Inflation (CPI) | National Average Earnings | Sample Balanced Fund* Total Return (I) | Sample Balanced Fund* Spread: I - NAE - e |
|---|---|---|---|---|---|---|---|---|
| 1950-59 | (0.1)% | 1.0 % | 1.9 % | 19.4 % | 2.2 % | 4.5 % | 10.5 % | 5.5 % |
| 1960-69 | 1.4 % | 1.7 % | 3.9 % | 7.8 % | 2.5 % | 4.3 % | 5.2 % | 0.4 % |
| 1970-79 | 5.5 % | 6.2 % | 6.3 % | 5.9 % | 7.4 % | 6.9 % | 6.3 % | (1.1)% |
| 1980-89 | 12.6 % | 13.0 % | 8.9 % | 17.5 % | 5.1 % | 5.8 % | 15.1 % | 8.8 % |
| 1990-99 | 8.8 % | 8.4 % | 4.9 % | 18.2 % | 2.9 % | 4.2 % | 13.2 % | 8.5 % |
| 2000-2002 | 14.1 % | 13.3 % | 3.8 % | (14.6)% | 2.4 % | 3.6 % | (1.3)% | (5.4)% |
| **Last 53 Years** | **6.0 %** | **6.4 %** | **5.1 %** | **11.8 %** | **3.9 %** | **5.1 %** | **9.3 %** | **3.7 %#** |

| * Sample Balanced Fund | |
|---|---|
| Equities | 50% |
| Bonds - Government | 20% |
| - Corporate | 20% |
| Cash Equivalents | 10% |
| | 100% |
| Fund expenses(e) | 0.50%@ |

**# Historical Spread**

# Observed spread is very sensitive to the observation period, even over long periods, as illustrated below:

| Observation Period | Spread |
|---|---|
| 53 years | 3.7% |
| 43 years | 3.3% |
| 33 years | 4.3% |
| 23 years | 6.7% |

@ Generally includes administration manager fees and transaction costs.

May vary anywhere from less than 0.3% to over 1.0% from system to system.

# SCHEDULE OF FUNDING PROGRESS
# (DOLLAR AMOUNTS IN MILLIONS)

| Valuation Date June 30 | (1) Actuarial Value of Assets | (2) Entry Age AAL | (3) UAAL (2)-(1) | (4) Funding Ratio (1)/(2) | (5) Annual Covered Payroll | (6) UAAL as % of Covered Payroll (3)/(5) |
|---|---|---|---|---|---|---|
| 1991+* | $2,434 | $2,762 | $ 328 | 88.1% | $909 | 36.1% |
| 1992+ | 2,729 | 3,329 | 600 | 82.0% | 1,077 | 55.7% |
| 1993+ | 3,051 | 3,712 | 661 | 82.2% | 1,120 | 59.0% |
| 1994 | 3,307 | 3,960 | 653 | 83.5% | 1,167 | 56.0% |
| 1995* | 3,626 | 4,257 | 631 | 85.2% | 1,234 | 51.1% |
| 1996 | 4,186 | 4,635 | 449 | 90.3% | 1,260 | 35.6% |
| 1997+ | 4,956 | 5,403 | 447 | 91.7% | 1,302 | 34.3% |
| 1998+* | 5,815 | 6,188 | 373 | 94.0% | 1,368 | 27.3% |
| 1999+ | 6,740 | 6,834 | 94 | 98.6% | 1,429 | 6.6% |
| 2000+ | 7,620 | 7,879 | 259 | 96.7% | 1,485 | 17.4% |
| 2001+ | 8,166 | 8,561 | 395 | 95.4% | 1,557 | 25.4% |
| 2002* | 8,328 | 9,062 | 734 | 91.9% | 1,628 | 45.1% |
| 2003 | 8,263 | 9,672 | 1,409 | 85.4% | 1,683 | 83.7% |
| 2003+ | 8,113 | 9,445 | 1,332 | 85.9% | 1,683 | 79.1% |

*+ Legislated benefit changes and one time adjustment in amortization method.*

** Revised actuarial assumptions.*

# SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

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, 2003 |
| Actuarial Cost Method | Entry age |
| Amortization Method | Level percent of payroll |
| Remaining Amortization Period | 36 years |
| Asset Valuation Method | 4-year smoothed market 80%/120% corridor |
| Actuarial Assumptions: | |
| Investment Rate of Return | 8.0% |
| Cost-of-living adjustments | 3.0% Simple |
| Projected Salary Increases* | 4.0% to 10.1% |
| *Includes wage inflation at | 4.0% |

# SECTION E

## Covered Member Data

***Active members included*** in the valuation totaled 62,432 with annual payroll totaling $1,683,364,753.

## TOTAL ACTIVE MEMBERS IN VALUATION JUNE 30, 2003 BY MEMBER'S CHOICE OF CONTRIBUTION RATE

| Attained Age | Members Contributing Now | | | Members Not Contributing | | | Total Members |
|---|---|---|---|---|---|---|---|
| | Men | Women | Total | Men | Women | Total | |
| Under 20 | 2 | 5 | 7 | 24 | 38 | 62 | 69 |
| 20-24 | 157 | 598 | 755 | 247 | 546 | 793 | 1,548 |
| 25-29 | 719 | 2,797 | 3,516 | 336 | 1,102 | 1,438 | 4,954 |
| 30-34 | 827 | 3,149 | 3,976 | 495 | 2,277 | 2,772 | 6,748 |
| 35-39 | 752 | 3,205 | 3,957 | 653 | 3,262 | 3,915 | 7,872 |
| 40-44 | 916 | 3,974 | 4,890 | 991 | 4,480 | 5,471 | 10,361 |
| 45-49 | 1,078 | 4,687 | 5,765 | 920 | 3,861 | 4,781 | 10,546 |
| 50-54 | 1,072 | 4,415 | 5,487 | 801 | 3,339 | 4,140 | 9,627 |
| 55-59 | 729 | 2,850 | 3,579 | 623 | 2,110 | 2,733 | 6,312 |
| 60-64 | 411 | 1,261 | 1,672 | 386 | 1,108 | 1,494 | 3,166 |
| 65-69 | 87 | 142 | 229 | 209 | 359 | 568 | 797 |
| 70 & Up | 33 | 32 | 65 | 177 | 190 | 367 | 432 |
| **Totals** | **6,783** | **27,115** | **33,898** | **5,862** | **22,672** | **28,534** | **62,432** |

# ACTIVE TEACHERS IN VALUATION JUNE 30, 2003
# BY MEMBER'S CHOICE OF CONTRIBUTION RATE

| Attained Age | Members Contributing Now | | | Members Not Contributing | | | Total Members |
|---|---|---|---|---|---|---|---|
| | Men | Women | Total | Men | Women | Total | |
| Under 20 | 1 | | 1 | | | | 1 |
| 20-24 | 84 | 419 | 503 | 5 | 28 | 33 | 536 |
| 25-29 | 561 | 2,169 | 2,730 | 60 | 207 | 267 | 2,997 |
| 30-34 | 633 | 2,246 | 2,879 | 189 | 767 | 956 | 3,835 |
| 35-39 | 543 | 2,136 | 2,679 | 295 | 976 | 1,271 | 3,950 |
| 40-44 | 647 | 2,619 | 3,266 | 412 | 1,372 | 1,784 | 5,050 |
| 45-49 | 779 | 3,303 | 4,082 | 416 | 1,455 | 1,871 | 5,953 |
| 50-54 | 765 | 3,217 | 3,982 | 362 | 1,329 | 1,691 | 5,673 |
| 55-59 | 432 | 1,769 | 2,201 | 213 | 666 | 879 | 3,080 |
| 60-64 | 199 | 686 | 885 | 66 | 222 | 288 | 1,173 |
| 65-69 | 14 | 45 | 59 | 10 | 22 | 32 | 91 |
| 70 & Up | | 7 | 7 | 2 | 2 | 4 | 11 |
| **Totals** | **4,658** | **18,616** | **23,274** | **2,030** | **7,046** | **9,076** | **32,350** |

This schedule includes Administrators.

# ACTIVE NON-TEACHERS IN VALUATION JUNE 30, 2003
# BY MEMBER'S CHOICE OF CONTRIBUTION RATE

| Attained Age | Members Contributing Now | | | Members Not Contributing | | | Total Members |
|---|---|---|---|---|---|---|---|
| | Men | Women | Total | Men | Women | Total | |
| Under 20 | 1 | 5 | 6 | 24 | 38 | 62 | 68 |
| 20-24 | 73 | 179 | 252 | 242 | 518 | 760 | 1,012 |
| 25-29 | 158 | 628 | 786 | 276 | 895 | 1,171 | 1,957 |
| 30-34 | 194 | 903 | 1,097 | 306 | 1,510 | 1,816 | 2,913 |
| 35-39 | 209 | 1,069 | 1,278 | 358 | 2,286 | 2,644 | 3,922 |
| 40-44 | 269 | 1,355 | 1,624 | 579 | 3,108 | 3,687 | 5,311 |
| 45-49 | 299 | 1,384 | 1,683 | 504 | 2,406 | 2,910 | 4,593 |
| 50-54 | 307 | 1,198 | 1,505 | 439 | 2,010 | 2,449 | 3,954 |
| 55-59 | 297 | 1,081 | 1,378 | 410 | 1,444 | 1,854 | 3,232 |
| 60-64 | 212 | 575 | 787 | 320 | 886 | 1,206 | 1,993 |
| 65-69 | 73 | 97 | 170 | 199 | 337 | 536 | 706 |
| 70 & Up | 33 | 25 | 58 | 175 | 188 | 363 | 421 |
| **Totals** | **2,125** | **8,499** | **10,624** | **3,832** | **15,626** | **19,458** | **30,082** |

# WOMEN ACTIVE MEMBERS IN VALUATION JUNE 30, 2003
## BY ATTAINED AGE AND YEARS OF SERVICE

| Attained Age | Years of Service to Valuation Date | | | | | | | Totals | |
|---|---|---|---|---|---|---|---|---|---|
| | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 Plus | No. | Valuation Payroll |
| Under 20 | 43 | | | | | | | 43 | $ 164,663 |
| 20-24 | 1,139 | 5 | | | | | | 1,144 | 16,623,461 |
| 25-29 | 3,238 | 661 | | | | | | 3,899 | 91,588,465 |
| 30-34 | 2,684 | 2,213 | 528 | 1 | | | | 5,426 | 129,432,064 |
| 35-39 | 2,670 | 1,779 | 1,529 | 488 | 1 | | | 6,467 | 149,432,941 |
| 40-44 | 2,899 | 2,082 | 1,415 | 1,532 | 525 | 1 | | 8,454 | 206,260,674 |
| 45-49 | 1,821 | 1,729 | 1,744 | 1,215 | 1,306 | 733 | | 8,548 | 248,384,355 |
| 50-54 | 1,384 | 1,297 | 1,537 | 1,450 | 878 | 1,165 | 43 | 7,754 | 238,459,493 |
| 55-59 | 1,003 | 725 | 894 | 1,060 | 678 | 554 | 46 | 4,960 | 142,037,445 |
| 60 | 141 | 103 | 105 | 128 | 97 | 93 | 8 | 675 | 17,809,598 |
| 61 | 118 | 109 | 94 | 123 | 87 | 74 | 6 | 611 | 16,067,828 |
| 62 | 103 | 82 | 86 | 84 | 66 | 56 | 3 | 480 | 11,795,795 |
| 63 | 95 | 62 | 58 | 60 | 38 | 38 | 4 | 355 | 8,294,134 |
| 64 | 66 | 41 | 51 | 42 | 20 | 23 | 5 | 248 | 5,139,501 |
| 65 | 69 | 41 | 26 | 22 | 18 | 18 | 3 | 197 | 3,818,543 |
| 66 | 48 | 14 | 8 | 6 | 2 | 1 | 3 | 82 | 1,145,645 |
| 67 | 55 | 13 | 2 | | | 2 | | 72 | 632,074 |
| 68 | 58 | 18 | 9 | 2 | | 1 | 2 | 90 | 1,020,164 |
| 69 | 41 | 9 | 7 | 1 | | 2 | | 60 | 582,445 |
| 70 & Up | 156 | 44 | 12 | 9 | | | 1 | 222 | 1,870,790 |
| **Totals** | **17,831** | **11,027** | **8,105** | **6,223** | **3,716** | **2,761** | **124** | **49,787** | **$1,290,560,078** |

# MEN ACTIVE MEMBERS IN VALUATION JUNE 30, 2003
## BY ATTAINED AGE AND YEARS OF SERVICE

| Attained Age | Years of Service to Valuation Date | | | | | | | Totals | |
|---|---|---|---|---|---|---|---|---|---|
| | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 Plus | No. | Valuation Payroll |
| Under 20 | 26 | | | | | | | 26 | $ 122,704 |
| 20-24 | 396 | 8 | | | | | | 404 | 5,335,154 |
| 25-29 | 853 | 198 | 4 | | | | | 1,055 | 27,487,700 |
| 30-34 | 591 | 623 | 108 | | | | | 1,322 | 39,625,650 |
| 35-39 | 478 | 418 | 425 | 83 | 1 | | | 1,405 | 45,265,147 |
| 40-44 | 660 | 370 | 318 | 436 | 122 | 1 | | 1,907 | 61,565,641 |
| 45-49 | 522 | 408 | 287 | 240 | 378 | 163 | | 1,998 | 71,686,466 |
| 50-54 | 471 | 328 | 293 | 226 | 176 | 360 | 19 | 1,873 | 69,717,881 |
| 55-59 | 440 | 278 | 235 | 151 | 110 | 113 | 25 | 1,352 | 44,201,275 |
| 60 | 82 | 38 | 40 | 29 | 13 | 9 | 2 | 213 | 6,273,742 |
| 61 | 61 | 45 | 26 | 21 | 17 | 7 | 2 | 179 | 5,139,610 |
| 62 | 70 | 36 | 35 | 14 | 9 | 4 | 2 | 170 | 4,879,154 |
| 63 | 64 | 29 | 16 | 8 | 5 | 1 | 2 | 125 | 3,003,495 |
| 64 | 55 | 22 | 18 | 9 | 3 | 2 | 1 | 110 | 2,334,109 |
| 65 | 39 | 25 | 9 | 4 | 1 | | | 78 | 1,479,621 |
| 66 | 47 | 13 | 6 | 3 | | | | 69 | 999,595 |
| 67 | 46 | 5 | 1 | 1 | | | | 53 | 535,396 |
| 68 | 32 | 9 | 2 | 1 | | | | 44 | 697,040 |
| 69 | 40 | 12 | | | | | | 52 | 574,861 |
| 70 & Up | 149 | 52 | 8 | | 1 | | | 210 | 1,880,434 |
| **Totals** | **5,122** | **2,917** | **1,831** | **1,226** | **836** | **660** | **53** | **12,645** | **$392,804,675** |

# TOTAL ACTIVE MEMBERS IN VALUATION JUNE 30, 2003
## BY ATTAINED AGE AND YEARS OF SERVICE

| Attained Age | Years of Service to Valuation Date | | | | | | | Totals | |
|---|---|---|---|---|---|---|---|---|---|
| | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 Plus | No. | Valuation Payroll |
| Under 20 | 69 | | | | | | | 69 | $ 287,367 |
| 20-24 | 1,535 | 13 | | | | | | 1,548 | 21,958,615 |
| 25-29 | 4,091 | 859 | 4 | | | | | 4,954 | 119,076,165 |
| 30-34 | 3,275 | 2,836 | 636 | 1 | | | | 6,748 | 169,057,714 |
| 35-39 | 3,148 | 2,197 | 1,954 | 571 | 2 | | | 7,872 | 194,698,088 |
| 40-44 | 3,559 | 2,452 | 1,733 | 1,968 | 647 | 2 | | 10,361 | 267,826,315 |
| 45-49 | 2,343 | 2,137 | 2,031 | 1,455 | 1,684 | 896 | | 10,546 | 320,070,821 |
| 50-54 | 1,855 | 1,625 | 1,830 | 1,676 | 1,054 | 1,525 | 62 | 9,627 | 308,177,374 |
| 55-59 | 1,443 | 1,003 | 1,129 | 1,211 | 788 | 667 | 71 | 6,312 | 186,238,720 |
| 60 | 223 | 141 | 145 | 157 | 110 | 102 | 10 | 888 | 24,083,340 |
| 61 | 179 | 154 | 120 | 144 | 104 | 81 | 8 | 790 | 21,207,438 |
| 62 | 173 | 118 | 121 | 98 | 75 | 60 | 5 | 650 | 16,674,949 |
| 63 | 159 | 91 | 74 | 68 | 43 | 39 | 6 | 480 | 11,297,629 |
| 64 | 121 | 63 | 69 | 51 | 23 | 25 | 6 | 358 | 7,473,610 |
| 65 | 108 | 66 | 35 | 26 | 19 | 18 | 3 | 275 | 5,298,164 |
| 66 | 95 | 27 | 14 | 9 | 2 | 1 | 3 | 151 | 2,145,240 |
| 67 | 101 | 18 | 3 | 1 | | 2 | | 125 | 1,167,470 |
| 68 | 90 | 27 | 11 | 3 | | 1 | 2 | 134 | 1,717,204 |
| 69 | 81 | 21 | 7 | 1 | | 2 | | 112 | 1,157,306 |
| 70 & Up | 305 | 96 | 20 | 9 | 1 | | 1 | 432 | 3,751,224 |
| **Totals** | **22,953** | **13,944** | **9,936** | **7,449** | **4,552** | **3,421** | **177** | **62,432** | **$1,683,364,753** |

# SUMMARY OF ACTIVE MEMBERS

| | Teachers | | Non-Teachers | | Total Active Members | |
|---|---|---|---|---|---|---|
| | No. | Payroll | No. | Payroll | No. | Payroll |
| Women | 25,662 | $ 952,074,255 | 24,125 | $ 338,485,823 | 49,787 | $ 1,290,560,078 |
| Men | 6,688 | 288,769,241 | 5,957 | 104,035,434 | 12,645 | 392,804,675 |
| All | 32,350 | $ 1,240,843,496 | 30,082 | $ 442,521,257 | 62,432 | $ 1,683,364,753 |

| | Teachers | Non-Teachers | Total |
|---|---|---|---|
| Members Contributing Now | 23,274 | 10,624 | 33,898 |
| Members Not Contributing | 9,076 | 19,458 | 28,534 |
| All | 32,350 | 30,082 | 62,432 |

| | Group Averages | | |
|---|---|---|---|
| | Women | Men | Total |
| Age: | 43.8 years | 44.7 years | 44.0 years |
| Service: | 9.6 years | 8.8 years | 9.5 years |
| Annual Pay: | $25,922 | $31,064 | $26,963 |

# ACTIVE MEMBERS IN VALUATION

| June 30 | Number | Group Averages | | | Active Member Payroll ($ Millions) |
|---|---|---|---|---|---|
| | | Age | Service | Annual Earnings | |
| 1986 | 34,274 | 40.5 | 10.6 | $19,180 | $ 657 |
| 1987 | 34,210 | 40.9 | 10.5 | 19,392 | 663 |
| 1988 | 38,024 | 40.8 | 10.0 | 19,274 | 733 |
| 1989 | 38,978 | 41.1 | 10.2 | 19,879 | 775 |
| 1990 | 41,800 | 41.3 | 9.9 | 19,776 | 827 |
| 1991 | 45,902 | 41.5 | 9.6 | 19,796 | 909 |
| 1992 | 55,688 | 41.3 | 8.5 | 19,338 | 1,077 |
| 1993 | 58,519 | 41.4 | 8.6 | 19,145 | 1,120 |
| 1994 | 57,402 | 42.1 | 9.1 | 20,337 | 1,167 |
| 1995 | 58,876 | 42.4 | 9.2 | 20,952 | 1,234 |
| 1996 | 56,100 | 43.0 | 9.8 | 22,463 | 1,260 |
| 1997 | 56,997 | 43.2 | 9.8 | 22,847 | 1,302 |
| 1998 | 58,528 | 43.4 | 9.7 | 23,380 | 1,368 |
| 1999 | 59,499 | 43.5 | 9.8 | 24,019 | 1,429 |
| 2000 | 60,147 | 43.6 | 9.6 | 24,696 | 1,485 |
| 2001 | 61,389 | 43.7 | 9.5 | 25,365 | 1,557 |
| 2002 | 62,011 | 43.8 | 9.4 | 26,254 | 1,628 |
| 2003 | 62,432 | 44.0 | 9.5 | 26,963 | 1,683 |

The figures on this historical schedule are affected by the inclusion of new non-teaching employees beginning July 1, 1989.

# DEFERRED VESTED MEMBERS AT JUNE 30, 2003
## BY ATTAINED AGE

| Age | Number | Estimated Annual Benefits | Contribution Balance |
|---|---|---|---|
| Below 40 | 1,983 | $ 6,671,637 | $ 4,225,984 |
| 40 | 304 | 1,082,642 | 759,163 |
| 41 | 324 | 1,210,126 | 1,059,949 |
| 42 | 335 | 1,244,149 | 1,137,155 |
| 43 | 307 | 1,139,245 | 1,281,573 |
| 44 | 318 | 1,227,347 | 1,392,065 |
| 45 | 317 | 1,288,982 | 1,546,056 |
| 46 | 352 | 1,413,130 | 1,834,234 |
| 47 | 339 | 1,378,201 | 1,601,987 |
| 48 | 331 | 1,457,839 | 2,143,645 |
| 49 | 316 | 1,318,162 | 1,743,662 |
| 50 | 336 | 1,673,334 | 2,919,069 |
| 51 | 329 | 1,646,113 | 2,663,976 |
| 52 | 296 | 1,373,073 | 2,179,380 |
| 53 | 323 | 1,737,533 | 3,271,560 |
| 54 | 309 | 1,544,800 | 3,112,291 |
| 55 | 294 | 1,644,990 | 3,460,787 |
| 56 | 308 | 1,580,188 | 3,525,783 |
| 57 | 190 | 1,000,969 | 2,365,061 |
| 58 | 224 | 1,177,473 | 2,710,261 |
| 59 | 238 | 1,167,838 | 3,181,926 |
| 60 & Up | 371 | 1,211,176 | 2,388,363 |
| **Totals** | **8,444** | **$35,188,947** | **$50,503,930** |

An inactive member is no longer actively working, and has sufficient service credit to qualify for a monthly benefit at retirement age.

# MEMBERS PARTICIPATING IN T-DROP AT JUNE 30, 2003
## BY ATTAINED AGE

| Age | Number | Current T-Drop Contribution | Original T-Drop Contribution |
|---|---|---|---|
| 46 | 1 | $ 12,431 | $ 12,690 |
| 47 | 1 | 8,055 | 8,850 |
| 48 | 5 | 68,830 | 70,699 |
| 49 | 25 | 385,680 | 389,357 |
| 50 | 94 | 1,408,329 | 1,422,284 |
| 51 | 241 | 3,960,043 | 3,957,831 |
| 52 | 321 | 5,489,474 | 5,378,879 |
| 53 | 385 | 6,723,248 | 6,461,403 |
| 54 | 427 | 7,669,258 | 7,230,076 |
| 55 | 454 | 8,249,678 | 7,642,195 |
| 56 | 493 | 9,363,506 | 8,464,233 |
| 57 | 297 | 5,551,092 | 4,940,904 |
| 58 | 275 | 5,301,215 | 4,608,364 |
| 59 | 260 | 5,265,677 | 4,596,223 |
| 60 | 219 | 4,236,922 | 3,590,107 |
| 61 | 177 | 3,363,138 | 2,838,074 |
| 62 | 140 | 2,646,632 | 2,260,498 |
| 63 | 82 | 1,623,667 | 1,366,698 |
| 64 | 65 | 1,336,422 | 1,084,878 |
| 65 | 45 | 985,053 | 780,366 |
| 66 | 37 | 839,496 | 713,609 |
| 67 | 23 | 491,578 | 380,977 |
| 68 | 15 | 325,141 | 262,371 |
| 69 | 11 | 270,692 | 223,834 |
| 70 | 7 | 174,388 | 146,232 |
| 71 | 5 | 124,071 | 102,431 |
| 72 | 3 | 91,557 | 91,441 |
| 73 | 1 | 22,329 | 22,620 |
| 74 | 3 | 54,701 | 42,845 |
| **Totals** | **4,112** | **$76,042,303** | **$69,090,969** |

A T-Drop member continues to work, but does not accrue service credit towards retirement. The member's FAS is frozen (see page C-2) at time of T-Drop election.

# ANNUITIES BEING PAID RETIREES AND BENEFICIARIES JULY 1, 2003
## BY TYPE OF ANNUITY BEING PAID

| Type of Annuity | No. | Annual Amounts | | |
|---|---|---|---|---|
| | | Original Annuities | Base Annuities | Current Annuities |
| **RETIREMENT RESERVE ACCOUNT** | | | | |
| Age & Service | | | | |
| Option 1 (Basic single life) | 14,341 | $158,208,164 | $222,470,047 | $259,004,600 |
| Option A (Joint & 100% S.) | 1,448 | 19,303,193 | 23,289,415 | 26,680,733 |
| Option B (Joint & 50% S.) | 1,004 | 17,940,110 | 22,513,347 | 26,125,523 |
| Option C (10 year certain) | 383 | 6,300,139 | 6,924,471 | 7,836,025 |
| Beneficiaries | 406 | 4,558,399 | 5,544,780 | 6,286,241 |
| Totals | 17,582 | 206,310,005 | 280,742,060 | 325,933,122 |
| Disability | | | | |
| Option 1 | 1,340 | 10,094,082 | 14,562,093 | 16,719,938 |
| Option A | 156 | 1,353,269 | 1,751,661 | 1,982,862 |
| Option B | 45 | 515,962 | 650,214 | 737,457 |
| Option C | 43 | 350,695 | 390,084 | 424,650 |
| Beneficiaries | 245 | 1,814,643 | 2,531,556 | 2,881,875 |
| Totals | 1,829 | 14,128,651 | 19,885,608 | 22,746,782 |
| Act 793 | 200 | 1,203,206 | 1,770,016 | 1,769,997 |
| Totals | 19,611 | 221,641,862 | 302,397,684 | 350,449,901 |
| **SURVIVOR'S BENEFIT ACCOUNT** | | | | |
| Beneficiaries of Deceased Members | 520 | 3,186,217 | 4,680,895 | 5,341,424 |
| **ACT 808** | | | | |
| Act 808 | 140 | 2,280,638 | 4,190,765 | 4,190,766 |
| **RETIREMENT SYSTEM TOTALS** | | | | |
| Total Annuities Being Paid | 20,271 | $227,108,717 | $311,269,344 | $359,982,091 |

**The Original Annuity** is the annuity at the date of retirement.
**The Base Annuity** is the amount from which the 3.0% COLA is calculated.
**The Current Annuity** is the annuity payable at July 1, 2003.

# SECTION F

# Actuarial Assumptions and Miscellaneous

# SUMMARY OF ASSUMPTIONS USED IN ACTUARIAL VALUATIONS FOR THE ARKANSAS TEACHER RETIREMENT SYSTEM ASSUMPTIONS ADOPTED BY BOARD OF TRUSTEES AFTER CONSULTING WITH ACTUARY

## *Economic Assumptions*

***The investment return rate*** used in making the valuation was 8.0% per year, compounded annually (net after administrative expenses). This rate of return is not the assumed real rate of return. The real rate of return is the portion of investment return which is more than the wage inflation rate. Considering wage inflation recognition of 4.0%, the 8.0% rate translates to an assumed real rate of return of 4.0%. This rate was first used for the ***June 30, 2002*** valuation.

***Pay increase assumptions*** for individual active members are shown on pages F-8 and F-9. Part of the assumption for each age is for a merit and/or seniority increase, and the other 4.0% recognizes wage inflation. These rates were first used for the ***June 30, 2002*** valuation.

**Price inflation** is assumed to persist at a level sufficient to produce a 3.0% COLA.

The Active Member Group size is assumed to remain constant at its present level.

***Total active member payroll*** is assumed to increase 4.0% a year, which is the portion of the individual pay increase assumptions attributable to wage inflation. This rate was first used for the ***June 30, 2002*** valuation.

## *Non-Economic Assumptions*

***The mortality table*** used to measure retired life mortality was the 1983 Group Annuity Mortality Table. Related values are shown on page F-4. This table was first used for the ***June 30, 1998*** valuation. For disabled lives, the mortality table is set forward 5 years. The set forward of 5 years was first used for the June 30, 2002 valuation.

***The probabilities of retirement*** for members eligible to retire are shown on page F-5 and F-6. The rates for full retirement were first used in the ***June 30, 2002*** valuation. The rates for reduced retirement were first used in the ***June 30, 2002*** valuation.

***The probabilities of withdrawal*** from service, ***death-in-service*** and ***disability*** are shown for sample ages on pages F-8 and F-9. The withdrawal and disability rates were first used in the **June 30, 2002** valuation. The death-in-service rates were first used in the **June 30, 2002** valuation.

***The entry age actuarial cost method of valuation*** was used in determining accrued liabilities and normal cost.

Differences in the past between assumed experience and actual experience ("actuarial gains and losses") become part of actuarial accrued liabilities.

Unfunded actuarial accrued liabilities are amortized to produce contribution amounts (the total of principal & interest) which are level percents of payroll contributions.

These cost methods were first used in the June 30, 1986 valuation.

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***Asset Valuation Method.*** A market value related asset method is used as described on page D-4. This method was first used in the June 30, 1995 valuation. It was modified following the 1997-2002 Experience Study to include an 80% - 120% market value corridor.

***The data about persons now covered and about present assets*** was furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary. Members whose dates of birth were not supplied were assumed to be 40 years old on the valuation date.

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The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (M.A.A.A.).

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***Non-teacher members*** were evaluated using non-economic assumptions shown on the following pages. Effective July 1, 1989 non-teacher employees who are newly hired by public schools become members of TRS.

# SINGLE LIFE RETIREMENT VALUES

| Sample Attained | Present Value of $1.00 Monthly for Life | | Present Value of $1 Monthly for Life Increasing 3.0% Annually | | Future Life Expectancy (years) | | Percent Dying within Next Year | |
|---|---|---|---|---|---|---|---|---|
| Ages | Men | Women | Men | Women | Men | Women | Men | Women |
| 40 | $142.98 | $147.82 | $184.74 | $193.70 | 38.46 | 44.52 | 0.12 % | 0.07 % |
| 45 | 138.18 | 144.67 | 176.24 | 187.61 | 33.74 | 39.69 | 0.22 % | 0.10 % |
| 50 | 132.10 | 140.42 | 165.94 | 179.79 | 29.18 | 34.92 | 0.39 % | 0.16 % |
| 55 | 124.57 | 134.74 | 153.75 | 169.90 | 24.82 | 30.24 | 0.61 % | 0.25 % |
| 60 | 115.04 | 127.24 | 139.16 | 157.58 | 20.64 | 25.67 | 0.92 % | 0.42 % |
| 65 | 103.26 | 117.61 | 122.19 | 142.67 | 16.69 | 21.29 | 1.56 % | 0.71 % |
| 70 | 90.18 | 105.53 | 104.27 | 125.11 | 13.18 | 17.13 | 2.75 % | 1.24 % |
| 75 | 76.40 | 91.57 | 86.27 | 105.96 | 10.15 | 13.37 | 4.46 % | 2.40 % |
| 80 | 62.65 | 77.16 | 69.17 | 87.10 | 7.64 | 10.20 | 7.41 % | 4.29 % |
| 85 | 50.59 | 62.99 | 54.72 | 69.36 | 5.73 | 7.58 | 11.48 % | 6.99 % |
| Ref: | 30 x 1.00 | 31 x 1.00 | 30 x 1.00 | 31 x 1.00 | | | | |

| Sample Attained Ages | Benefit Increasing 3.0% Yearly | Portion of Age 60 Lives Still Alive | |
|---|---|---|---|
| | | Men | Women |
| 60 | $100.00 | 100% | 100% |
| 65 | 115.00 | 94% | 97% |
| 70 | 130.00 | 85% | 93% |
| 75 | 145.00 | 72% | 86% |
| 80 | 160.00 | 54% | 73% |
| Ref | | 30 | 31 |

# PROBABILITIES OF RETIREMENT FOR MEMBERS

| Retirement Ages | % of Active Participants Retiring with Unreduced Benefits | | | |
|---|---|---|---|---|
| | Education | | Support | |
| | Male | Female | Male | Female |
| 48 | 50% | 40% | 40% | 30% |
| 49 | 50% | 40% | 40% | 30% |
| 50 | 10% | 10% | 7% | 10% |
| 51 | 10% | 10% | 7% | 10% |
| 52 | 10% | 10% | 14% | 12% |
| 53 | 13% | 13% | 16% | 15% |
| 54 | 14% | 14% | 18% | 20% |
| 55 | 15% | 16% | 20% | 22% |
| 56 | 15% | 16% | 22% | 22% |
| 57 | 15% | 19% | 25% | 22% |
| 58 | 15% | 20% | 27% | 27% |
| 59 | 20% | 25% | 35% | 40% |
| 60 | 15% | 15% | 16% | 16% |
| 61 | 20% | 20% | 25% | 20% |
| 62 | 30% | 25% | 35% | 30% |
| 63 | 20% | 25% | 25% | 25% |
| 64 | 20% | 20% | 25% | 25% |
| 65 | 35% | 35% | 35% | 40% |
| 66 | 30% | 35% | 30% | 30% |
| 67 | 30% | 30% | 30% | 30% |
| 68 | 30% | 30% | 30% | 30% |
| 69 | 30% | 30% | 30% | 30% |
| 70 | 30% | 30% | 30% | 30% |
| 71 | 30% | 30% | 30% | 30% |
| 72 | 30% | 30% | 30% | 30% |
| 73 | 30% | 30% | 30% | 30% |
| 74 | 30% | 30% | 30% | 30% |
| 75 | 100% | 100% | 100% | 100% |
| Ref | 827 | 828 | 829 | 830 |

# PROBABILITIES OF REDUCED RETIREMENT FOR MEMBERS

| Retirement Ages | % of Active Participants Retiring with Reduced Benefits | | | |
|---|---|---|---|---|
| | Education | | Support | |
| | Male | Female | Male | Female |
| 50 | 2% | 2% | 2% | 2% |
| 51 | 2% | 2% | 2% | 2% |
| 52 | 3% | 3% | 3% | 3% |
| 53 | 4% | 4% | 4% | 4% |
| 54 | 4% | 4% | 4% | 4% |
| 55 | 6% | 6% | 6% | 6% |
| 56 | 9% | 5% | 9% | 5% |
| 57 | 9% | 5% | 9% | 5% |
| 58 | 9% | 5% | 9% | 5% |
| 59 | 9% | 5% | 9% | 5% |
| 60 | 100% | 100% | 100% | 100% |
| Ref | 826 | 825 | 826 | 825 |

# PROBABILITIES OF T-DROP FOR MEMBERS

| Ages | Percent of Eligible Active Members Entering T-Drop within Next Year | | | |
|---|---|---|---|---|
| | Education | | Support | |
| | Male | Female | Male | Female |
| 50 | 40% | 45% | 30% | 20% |
| 51 | 35% | 45% | 30% | 30% |
| 52 | 50% | 45% | 55% | 45% |
| 53 | 50% | 45% | 55% | 50% |
| 54 | 45% | 45% | 55% | 50% |
| 55 | 45% | 45% | 45% | 50% |
| 56 | 45% | 40% | 45% | 50% |
| 57 | 45% | 40% | 45% | 50% |
| 58 | 45% | 40% | 50% | 50% |
| 59 | 45% | 40% | 50% | 50% |
| 60 | 45% | 35% | 50% | 40% |
| 61 | 45% | 35% | 50% | 30% |
| 62 | 40% | 35% | 50% | 30% |
| 63 | 30% | 35% | 50% | 30% |
| 64 | 40% | 40% | 50% | 40% |
| 65 | 50% | 50% | 50% | 50% |
| 66 | 50% | 50% | 50% | 50% |
| 67 | 50% | 50% | 50% | 50% |
| 68 | 50% | 50% | 50% | 50% |
| 69 | 50% | 50% | 50% | 50% |
| 70 | 50% | 50% | 50% | 50% |
| 71 | 50% | 50% | 50% | 50% |
| 72 | 50% | 50% | 50% | 50% |
| 73 | 50% | 50% | 50% | 50% |
| 74 | 50% | 50% | 50% | 50% |
| 75 | 50% | 50% | 50% | 50% |
| 76 | 50% | 50% | 50% | 50% |
| 77 | 50% | 50% | 50% | 50% |
| 78 | 50% | 50% | 50% | 50% |
| 79 | 50% | 50% | 50% | 50% |
| Ref | 270 | 271 | 272 | 273 |

Members entering T-Drop are assumed to remain in T-Drop according to the following table:

| Entry Age | Assumed Duration Years |
|---|---|
| 50-56 | 6 |
| 57 | 5 |
| 58 | 4 |
| 59+ | 3 |

# TEACHERS
# SEPARATIONS FROM ACTIVE EMPLOYMENT BEFORE AGE AND SERVICE RETIREMENT & INDIVIDUAL PAY INCREASES

| Sample Ages | Service | Percent of Active Members Separating Within the Next Year | | | | | |
|---|---|---|---|---|---|---|---|
| | | Death | | Disability | | Other | |
| | | Men | Women | Men | Women | Men | Women |
| | 0 | | | | | 32.00% | 25.00% |
| | 1 | | | | | 15.00% | 12.00% |
| | 2 | | | | | 11.00% | 9.00% |
| | 3 | | | | | 7.50% | 9.00% |
| | 4 | | | | | 5.00% | 7.00% |
| 20 | 5 & Up | 0.02% | 0.01% | 0.10% | 0.09% | 4.60% | 4.60% |
| 25 | | 0.02% | 0.01% | 0.10% | 0.09% | 4.60% | 4.84% |
| 30 | | 0.03% | 0.02% | 0.08% | 0.07% | 3.94% | 4.40% |
| 35 | | 0.04% | 0.02% | 0.08% | 0.07% | 3.20% | 3.10% |
| 40 | | 0.06% | 0.03% | 0.14% | 0.13% | 2.70% | 2.20% |
| 45 | | 0.11% | 0.05% | 0.24% | 0.22% | 2.08% | 2.00% |
| 50 | | 0.20% | 0.08% | 0.53% | 0.47% | 1.62% | 1.70% |
| 55 | | 0.31% | 0.13% | 0.88% | 0.79% | 1.50% | 1.50% |
| 60 | | 0.46% | 0.21% | 1.00% | 0.90% | 1.50% | 1.50% |
| 65 | | 0.78% | 0.35% | 1.00% | 0.90% | 1.50% | 1.50% |
| Ref: | | 30 x 0.5 | 31 x 0.5 | 135 x 1 | 135 x 0.9 | 136<br>556 | 272<br>558 |

| Age | Pay Increase Assumptions for an Individual Member | | |
|---|---|---|---|
| | Merit & Seniority | Base (Economic) | Increase Next Year |
| 20 | 5.4% | 4.0% | 9.4% |
| 25 | 4.4% | 4.0% | 8.4% |
| 30 | 3.4% | 4.0% | 7.4% |
| 35 | 2.4% | 4.0% | 6.4% |
| 40 | 1.7% | 4.0% | 5.7% |
| 45 | 1.2% | 4.0% | 5.2% |
| 50 | 0.8% | 4.0% | 4.8% |
| 55 | 0.4% | 4.0% | 4.4% |
| 60 | 0.3% | 4.0% | 4.3% |
| 65 | 0.0% | 4.0% | 4.0% |
| Ref: | 197 | | |

# NON-TEACHERS
# SEPARATIONS FROM ACTIVE EMPLOYMENT BEFORE AGE AND SERVICE RETIREMENT & INDIVIDUAL PAY INCREASES

| Sample Ages | Service | Percent of Active Members Separating Within the Next Year | | | | | |
|---|---|---|---|---|---|---|---|
| | | Death | | Disability | | Other | |
| | | Men | Women | Men | Women | Men | Women |
| | 0 | | | | | 40.00% | 40.00% |
| | 1 | | | | | 30.00% | 25.00% |
| | 2 | | | | | 22.00% | 18.00% |
| | 3 | | | | | 18.00% | 14.00% |
| | 4 | | | | | 13.00% | 11.00% |
| 20 | 5 & Up | 0.02% | 0.01% | 0.10% | 0.08% | 13.00% | 11.00% |
| 25 | | 0.02% | 0.01% | 0.10% | 0.08% | 12.00% | 11.00% |
| 30 | | 0.03% | 0.02% | 0.08% | 0.07% | 10.80% | 7.60% |
| 35 | | 0.04% | 0.02% | 0.08% | 0.07% | 8.20% | 5.40% |
| 40 | | 0.06% | 0.03% | 0.14% | 0.12% | 5.80% | 4.70% |
| 45 | | 0.11% | 0.05% | 0.24% | 0.19% | 4.10% | 4.20% |
| 50 | | 0.20% | 0.08% | 0.53% | 0.42% | 2.90% | 2.80% |
| 55 | | 0.31% | 0.13% | 0.88% | 0.70% | 1.90% | 1.70% |
| 60 | | 0.46% | 0.21% | 1.00% | 0.80% | 1.50% | 1.50% |
| 65 | | 0.78% | 0.35% | 1.00% | 0.80% | 1.50% | 1.50% |
| Ref: | | 30 x 0.5 | 31 x 0.5 | 135 x 1 | 135 x 0.8 | 273<br>560 | 274<br>559 |

| Age | Pay Increase Assumptions for an Individual Member | | |
|---|---|---|---|
| | Merit & Seniority | Base (Economic) | Increase Next Year |
| 20 | 6.1% | 4.0% | 10.1% |
| 25 | 5.2% | 4.0% | 9.2% |
| 30 | 4.2% | 4.0% | 8.2% |
| 35 | 3.6% | 4.0% | 7.6% |
| 40 | 2.9% | 4.0% | 6.9% |
| 45 | 1.5% | 4.0% | 5.5% |
| 50 | 0.6% | 4.0% | 4.6% |
| 55 | 0.2% | 4.0% | 4.2% |
| 60 | 0.0% | 4.0% | 4.0% |
| 65 | 0.0% | 4.0% | 4.0% |
| Ref: | 198 | | |

# MISCELLANEOUS AND TECHNICAL ASSUMPTIONS
# JUNE 30, 2003

| | |
|---|---|
| Marriage Assumption: | 100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses. |
| Pay Increase Timing: | Beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date. |
| Decrement Timing: | Decrements are assumed to occur mid-year, with the exception of normal and early retirement and T-DROP, which are assumed to occur at the beginning of the year. |
| Eligibility Testing: | Eligibility for benefits is determined based upon the age nearest birthday and exact fractional service on the date the decrement is assumed to occur. |
| Decrement Relativity: | Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects. |
| Decrement Operation: | Disability and mortality decrements do not operate during the first 5 years of service. Disability and turnover do not operate during retirement eligibility. |
| Normal Form of Benefit: | The assumed normal form of benefit is the straight life form. |
| Incidence of Contributions: | Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made. |
| Approximations | Adjustments were made to liabilities for T-DROP to allow for interest accumulation at 2% below the assumed rate of return. |
| Loads | A 0.25% load was included to account for subsidized Options, Service Purchases, etc. |

# GLOSSARY

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

***Accumulated Benefit Obligation***. The actuarial present value of vested and non-vested benefits based on service to date and past and current salary levels.

***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."

***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.

***Actuarial Present Value of Credited Projected Benefits*** or Pension Benefit Obligation. The present value of future benefits based on service to date and the effect projected salary increases.

***Actuary***. A person who is trained in the applications of probability and compound interest to problems in business and finance that involve payment of money in the future, contingent upon the occurrence of future events. Most actuaries in the United States are Members of the American Academy of Actuaries. The Society of Actuaries is an international research, education and membership organization for actuaries in the life and health insurance, employee benefits, and pension fields. It administers a series of examinations leading initially to Associateship and the designation A.S.A. and ultimately to Fellowship with the designation F.S.A. The federal government certifies actuaries to practice under ERISA with the designation of E.A.

***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.

February 10, 2004

Mr. David Malone, Executive Director
Arkansas Teacher Retirement System
Education Building West
State Capitol Grounds
Little Rock, Arkansas 72201

Re: Report of June 30, 2003 Actuarial Valuation
of Active and Inactive Members

Dear Mr. Malone:

Enclosed are 35 copies of the report. If you need anything else, please call.

Sincerely,

Judith A. Kermans

JAK/TCB/bd
Enclosure