

**REPORT ON THE FIFTY-NINTH ANNUAL VALUATION  
OF THE TEACHERS' AND STATE EMPLOYEES'  
RETIREMENT SYSTEM OF NORTH CAROLINA  
PREPARED AS OF DECEMBER 31, 2001**

October 22, 2002

Board of Trustees  
Teachers' and State Employees'  
Retirement System of North Carolina  
325 North Salisbury Street  
Raleigh, NC 27603

Members of the Board:

We submit herewith our report on the fifty-ninth annual valuation of the Teachers' and State Employees' Retirement System of North Carolina prepared as of December 31, 2001. The report has been prepared in accordance with North Carolina General Statute 135-6(o).

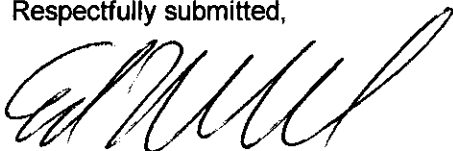
The system was amended effective July 1, 2002 to provide a 1.4% increase in the benefit to beneficiaries on the roll as of July 1, 2001 and to provide a prorated portion of a 1.4% increase for beneficiaries who retired after July 1, 2001 but before June 30, 2002. In addition, the system was amended effective July 1, 2002 to increase the benefit accrual rate from 1.81% to 1.82% and to provide an additional 0.6% to beneficiaries in receipt of an allowance as of June 1, 2002. The cost of these amendments were covered by gains which developed during the 2000 valuation year.

The Appropriations Act of 2002 sets contributions at 0.00% of payroll effective July 1, 2002. On this basis, there is a preliminary reserve from undistributed gains equivalent to 0.16% of payroll. However, the System is owed 1.17% of employer contributions, the unpaid portion of the amount escrowed during the 2000/2001 fiscal year. Assuming that the undistributed gains are used to apply towards the amount owed to the System, there are no remaining undistributed gains to be used for benefit improvements. Due to the volatility in the equity markets, it would be more prudent and conservative to use an amortization period of 20 years instead of 9 years as required by the legislature. The market gains that have been accumulated, but not yet recognized, can be better protected if utilized over a longer period of time, by extending the amortization period.

The valuation has been prepared in accordance with the parameters of Statement Nos. 25 and 27 of the Governmental Accounting Standards Board. The annual required contribution (ARC) under GASB for the 2003-2004 fiscal year is 0.00% of payroll which will liquidate the unfunded accrued liability within a 10-year period. The System continues to have a net pension obligation since a portion of the employer contribution was escrowed during the 2000/2001 fiscal year remains unpaid.

The Table of Contents, which immediately follows, outlines the material contained in the report.

Respectfully submitted,



Edward A. Macdonald  
Principal, Consulting Actuary

EAM:sr

## TABLE OF CONTENTS

<b><u>Section</u></b>	<b><u>Item</u></b>	<b><u>Page No.</u></b>
I	Summary of Principal Results	1
II	Membership Data	2
III	Valuation Balance Sheet	3
IV	Comments on Valuation	5
V	Comments on Experience and Gains	6
VI	Rates of Payment to Pension Accumulation Fund	7
VII	Accounting Information	8
 <b><u>Schedule</u></b>		
A	Development of Actuarial Value of Assets	11
B	Statement of Actuarial Assumptions and Methods	12
C	Summary of Main Benefit and Contribution Provisions	14
D	Detailed Tabulations of the Data	18

**REPORT ON THE FIFTY-NINTH ANNUAL VALUATION OF THE  
TEACHERS' AND STATE EMPLOYEES' RETIREMENT SYSTEM OF NORTH CAROLINA  
PREPARED AS OF DECEMBER 31, 2001**

**SECTION I - SUMMARY OF PRINCIPAL RESULTS**

1. This report, prepared as of December 31, 2001, presents the results of the fifty-ninth actuarial valuation of the system. For convenience of reference, the principal results of the valuation and a comparison with the preceding year's results are summarized below. The current valuation reflects the benefit increases granted to beneficiaries as of July 1, 2002 and amendments to the system effective through July 1, 2002.

**TABLE I  
SUMMARY OF PRINCIPAL RESULTS**

VALUATION DATE	12/31/01	12/31/00
Active members included in valuation		
Number	297,252	292,311
Annual compensation	\$ 9,494,602,568	\$ 9,001,353,605
Beneficiaries		
Number	112,482	107,743
Annual allowances	\$ 1,825,374,227	\$ 1,678,159,215
Assets		
Actuarial value	\$ 42,104,086,026	\$ 39,773,747,165
Market value	44,082,657,056	45,942,585,003
Unfunded accrued liability	\$ (4,390,422,826)	\$ (4,524,977,179)
<b>CONTRIBUTIONS FOR FISCAL YEAR ENDING</b>	<b>June 30, 2004</b>	<b>June 30, 2003</b>
<u>Appropriations Act</u>		
Employer contribution rate		
Normal	6.77%	6.70%
Accrued liability	<u>(6.77)</u>	<u>(4.73)</u>
Total	0.00%	1.97%
<u>GASB 25/27</u>		
Annual required contribution (ARC) of employer		
Normal	6.77%	6.70%
Accrued liability	<u>(6.77)</u>	<u>(6.70)</u>
Total	0.00%	0.00%
Liquidation period	10 years	11 years
Preliminary undistributed gains	0.16%	1.97%
Estimated adjustment for required Employer contributions not made	<u>(1.17%)</u>	<u>(1.42%)</u>
Reserve from undistributed gains	N/A	0.55%

2. The valuation balance sheet showing the results of the valuation is given in Section III.
3. Comments on the valuation results are given in Section IV, comments on the experience and actuarial gains during the valuation year are given in Section V and the rates of contribution payable by employers are given in Section VI.
4. Schedule B of this report outlines the full set of actuarial assumptions and methods employed. There have been no changes since the previous valuation. Schedule A of this report presents the development of the actuarial value of assets.
5. Schedule C gives a summary of the benefit and contribution provisions of the system. Since the previous valuation, the benefit accrual rate has been increased from 1.81% to 1.82%.

## **SECTION II - MEMBERSHIP DATA**

Data regarding the membership of the system for use as a basis for the valuation were furnished by the system's office. The following tables summarize the membership of the system as of December 31, 2001 upon which the valuation was based. Detailed tabulations of the data are given in Schedule D.

**TABLE II**

**THE NUMBER AND ANNUAL COMPENSATION OF ACTIVE MEMBERS  
INCLUDED IN THE VALUATION AS OF DECEMBER 31, 2001**

GROUP	NUMBER	ANNUAL COMPENSATION
Teachers	134,033	\$ 4,595,600,865
Employees	160,539	4,786,984,107
Law Enforcement Officers	<u>2,680</u>	<u>112,017,596</u>
Total	297,252	\$ 9,494,602,568

There are, in addition, 48,681 inactive members and 3,407 members who were excluded from the table because of insufficient data. The results of the valuation were adjusted to take these members into account.

TABLE III

**THE NUMBER AND ANNUAL RETIREMENT ALLOWANCES OF BENEFICIARIES  
AND SURVIVORS ON THE ROLL AS OF DECEMBER 31, 2001**

GROUP	NUMBER	ANNUAL RETIREMENT ALLOWANCES
<u>Beneficiaries Receiving Service Retirement Allowances</u>		
Teachers	46,245	\$ 973,766,428
Employees	48,537	620,428,720
Law Enforcement Officers	<u>1,481</u>	<u>36,561,886</u>
Total	96,263	\$ 1,630,757,034
<u>Beneficiaries Receiving Disability Retirement Allowances</u>		
Teachers	3,166	\$ 56,879,000
Employees	3,024	36,417,714
Law Enforcement Officers	<u>162</u>	<u>3,343,149</u>
Total	6,352	\$ 96,639,863
<u>Benefits to Survivors of Deceased Beneficiaries</u>		
Teachers	2,955	\$ 38,265,898
Employees	6,691	56,236,923
Law Enforcement Officers	<u>221</u>	<u>3,474,509</u>
Total	9,867	\$ 97,977,330
Grand Total	<u>112,482</u>	<u>\$ 1,825,374,227</u>

**SECTION III - VALUATION BALANCE SHEET**

The following valuation balance sheet shows the assets and liabilities of the retirement system as of the current valuation date of December 31, 2001 and, for comparison purposes, as of the immediately previous valuation date of December 31, 2000. The items shown in the balance sheet are present values actuarially determined as of the relevant valuation date. The development of the actuarial value of assets is presented in Schedule A.

**TABLE IV**

**VALUATION BALANCE SHEET**  
**SHOWING THE ASSETS AND LIABILITIES OF THE**  
**TEACHERS' AND STATE EMPLOYEES'**  
**RETIREMENT SYSTEM OF NORTH CAROLINA**

<b>ASSETS</b>	<b>DECEMBER 31, 2001</b>	<b>DECEMBER 31, 2000</b>
Current actuarial value of assets:		
Annuity Savings Fund	\$ 6,421,852,841	\$ 6,078,884,844
Pension Accumulation Fund	<u>35,682,233,185</u>	<u>33,694,862,321</u>
Total current assets	\$ 42,104,086,026	\$ 39,773,747,165
Future member contributions to Annuity Savings Fund	\$ 5,527,713,120	\$ 5,256,054,210
Prospective contributions to Pension Accumulation Fund:		
Normal contributions	\$ 6,144,974,418	\$ 5,781,659,631
Unfunded accrued liability contributions	(4,390,422,826)	(4,524,977,179)
Undistributed gain contributions	<u>98,550,093</u>	<u>1,056,814,998</u>
Total prospective contributions	<u>\$ 1,853,101,685</u>	<u>\$ 2,313,497,450</u>
Total Assets	<u>\$ 49,484,900,831</u>	<u>\$ 47,343,298,825</u>
<b>LIABILITIES</b>		
Annuity Savings Fund:		
Past member contributions	\$ 6,421,852,841	\$ 6,078,884,844
Future member contributions	<u>5,527,713,120</u>	<u>5,256,054,210</u>
Total contributions to Annuity Savings Fund	\$ 11,949,565,961	\$ 11,334,939,054
Pension Accumulation Fund:		
Benefits currently in payment	\$ 16,308,089,907	\$ 14,943,297,371
Benefits to be paid to current active members	20,792,144,356	19,696,610,432
Reserve for increases in retirement allowances effective July 1, 2002 (July 1, 2001 for December 31, 2000 figure)	336,550,514	311,636,970
Reserve from undistributed gains	<u>98,550,093</u>	<u>1,056,814,998</u>
Total benefits payable from Pension Accumulation Fund	<u>\$ 37,535,334,870</u>	<u>\$ 36,008,359,771</u>
Total Liabilities	<u>\$ 49,484,900,831</u>	<u>\$ 47,343,298,825</u>

## **SECTION IV - COMMENTS ON VALUATION**

The valuation balance sheet gives the following information with respect to the funds of the system as of December 31, 2001.

### **Annuity Savings Fund**

The Annuity Savings Fund is the fund to which are credited contributions made by members together with interest thereon. When a member retires, the amount of his accumulated contributions is transferred from the Annuity Savings Fund to the Pension Accumulation Fund. The assets credited to the Annuity Savings Fund on December 31, 2001, which represent the accumulated contributions of members to that date, amounted to \$6,421,852,841. The balance sheet also shows that the future contributions by members have a present value of \$5,527,713,120. The present value of both past and future contributions of members is therefore equal to \$11,949,565,961. The liabilities of this fund are also shown to be equal to \$11,949,565,961.

### **Pension Accumulation Fund**

The Pension Accumulation Fund is the fund to which the contributions made by employers are credited and from which are paid all benefits on account of beneficiaries and their survivors.

The current market related actuarial value of assets creditable to the Pension Accumulation Fund on December 31, 2001, amounted to \$35,682,233,185. The liabilities on account of active members amounted to \$20,792,144,356. In addition, the balance sheet indicates liabilities of \$16,308,089,907 on account of all benefits payable to beneficiaries and survivors as of December 31, 2001. The balance sheet also shows a reserve of \$336,550,514 to provide for the increases in retirement allowances effective July 1, 2002, and a reserve from undistributed gains of \$98,550,093. The total liabilities of the Pension Accumulation Fund, therefore, amounted to \$37,535,334,870. The difference between these liabilities and the current assets credited to this fund is \$1,853,101,685 which represents the present value of future contributions to be made by the employers. Of this amount, \$6,144,974,418 represents the present value of prospective normal contributions by the employers, \$(4,390,422,826) represents the present value of prospective accrued liability contributions by employers and the balance of \$98,550,093 represents the present value of prospective contributions on account of undistributed actuarial gains.

The retirement act provides that the contributions of employers shall consist of a normal contribution and an accrued liability contribution. G.S. 135-8(d)(2) of the retirement act provides that the normal contribution rate is to be determined as the uniform percentage of the earnable compensation of the average new entrant throughout his entire period of active service and is to be determined after each valuation. The valuation indicates that the uniform normal percentage contribution rate should be set at 6.77% of compensation.



The present valuation indicates that if the employer contribution rate is set at 0.00% of payroll in accordance with the Appropriations Act of 2002, the accrued liability rate would be equal to (6.77%) of payroll effective July 1, 2003. The required employer contribution is 0.00% which will liquidate the unfunded accrued liability within a 10-year period.

#### **SECTION V - COMMENTS ON EXPERIENCE AND GAINS**

The unfunded accrued liability has increased to \$(4,390) million from \$(4,525) million since the prior valuation. The significant items which affected the unfunded accrued liability were; amendments effective July 1, 2002 which increased the unfunded accrued liability by \$343 million and the 2001 adjustment towards market value of assets which decreased the unfunded accrued liability by \$495 million.

The valuation results indicates that there is a preliminary reserve from undistributed gains equivalent to 0.16% of payroll. However, the System is owed 1.17% of employer contributions, the unpaid portion of the amount escrowed during the 2000/2001 fiscal year. Assuming the undistributed gains are used to apply towards the amount owed to the System, there are no remaining undistributed gains to provide for benefit improvements. Each 1.0% increase in retirement allowances as of July 1, 2003 to beneficiaries on the retirement roll on July 1, 2002 and a prorated portion of each 1.0% increase as of July 1, 2003 for beneficiaries who retired after July 1, 2002 but before June 30, 2003 is equivalent to 0.29% of payroll. The cost of each 0.01% increase in the defined benefit formula with a corresponding increase in retirement allowances to all current benefit recipients is 0.42% of payroll.

**SECTION VI - RATES OF PAYMENT TO PENSION ACCUMULATION FUND**

The valuation balance sheet gives the basis for determining the percentage rates for contributions to be made by employers to the Pension Accumulation Fund and the Death Benefit Fund under the provisions of the retirement act. The following table shows the rates of contribution payable by employers as determined from the Appropriations Act and the present valuation for the 2003/2004 fiscal year.

**TABLE V****RATES OF CONTRIBUTION PAYABLE BY EMPLOYERS  
FOR THE 2003/2004 FISCAL YEAR  
BASED ON THE APPROPRIATIONS ACT  
AND THE VALUATION AS OF DECEMBER 31, 2001**

<b>CONTRIBUTION</b>	<b>RATE</b>
Normal	6.77%
Actuarial Accrued Liability	<u>(6.77)</u>
Total	0.00%

**SECTION VII - ACCOUNTING INFORMATION**

1. Statement Nos. 25 and 27 of the Governmental Accounting Standards Board (GASB) set forth certain items of information to be disclosed in the financial statements of the System and the employer. One such item is a distribution of the number of employees by type of membership, as follows:

**NUMBER OF ACTIVE AND RETIRED PARTICIPANTS  
AS OF DECEMBER 31, 2001**

GROUP	NUMBER
Retired participants and beneficiaries currently receiving benefits	112,490
Terminated participants and beneficiaries entitled to benefits but not yet receiving benefits	52,088
Active Participants	<u>297,252</u>
Total	461,830

2. Another such item is the schedule of funding progress as shown below.

**SCHEDULE OF FUNDING PROGRESS**

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b - a) / c)
12/31/96	\$25,357,459,643	\$25,478,192,954	\$120,733,311	99.5%	\$6,845,184,671	1.76%
12/31/97	27,765,057,295	28,071,156,226	306,098,931	98.9	7,373,712,592	4.15
12/31/98	31,847,438,198	30,354,221,675	(1,493,216,523)	104.9	7,994,825,684	(18.68)
12/31/99*	36,119,259,376	32,787,108,267	(3,332,142,109)	110.2	8,437,649,280	(39.49)
12/31/00*	39,773,747,165	35,248,769,986	(4,524,977,179)	112.8	9,001,353,605	(50.27)
12/31/01	42,104,086,026	37,713,663,200	(4,390,422,826)	111.6	9,494,602,568	(46.24)

\* These numbers have been revised since the previous valuation to reflect the requirements enacted by the legislature.

3. Following is the calculation of the annual pension cost and net pension obligation for the fiscal year ending June 30, 2002.

Annual Pension Cost and Net Pension Obligation\* for Fiscal Year Ending 6/30/2002

(a) Employer annual required contribution	\$196,003,000
(b) Interest on net pension obligation	15,106,000
(c) Adjustment to annual required contribution	<u>(31,206,000)</u>
(d) Annual pension cost: (a) + (b) + (c)	\$179,903,000
(e) Employer contributions made for fiscal year ending 6/30/2002	<u>276,993,000</u>
(f) Increase (decrease) in net pension obligation: (d) – (e)	\$(97,090,000)
(g) Net pension obligation beginning of fiscal year	<u>208,363,000</u>
(h) Net pension obligation end of fiscal year: (f) + (g)	\$111,273,000

\*There is pending legislation to pay back the NPO within five years.

**TREND INFORMATION**

<u>Year Ending</u>	<u>Annual Pension Cost (APC)</u>	<u>Percentage of APC Contributed</u>	<u>Net Pension Obligation</u>
December 31, 1999	\$681,808,588	100.0%	\$ 0
June 30, 2001	513,907,000	59.5	208,363,000
June 30, 2002	179,903,000	154.0	111,273,000

4. The annual required contribution (ARC) of the employer as a percentage of payroll, determined in accordance with the parameters of GASB 25/27, is shown below. The accrued liability rate is based on amortization of the unfunded actuarial accrued liability of \$(4,390,422,826) over a 10-year period from the valuation date.

**2003/2004 FISCAL YEAR  
ANNUAL REQUIRED CONTRIBUTION (ARC)  
BASED ON THE VALUATION AS OF DECEMBER 31, 2001**

<b>ANNUAL REQUIRED CONTRIBUTION (ARC)</b>	<b>RATE</b>
Normal	6.77%
Accrued liability	<u>(6.77)</u>
Total	0.00%

5. Additional information as of December 31, 2001 follows.

Valuation date	12/31/01
Actuarial cost method	Entry age
Amortization method	Level dollar open
Remaining amortization period	10 years
Asset valuation method	5-year smoothed market
Actuarial assumptions:	
Investment rate of return*	7.25%
Projected salary increases*	5.45-12.08%
*Includes inflation at	3.75%
Cost-of-living adjustments	N/A

**SCHEDULE A****DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS  
FOR THE YEAR ENDING DECEMBER 31, 2001**

1.	Actuarial Value of Assets as of December 31, 2000	\$ 39,773,747,165
2.	2001 Net Cash Flow	
	a. Contributions	834,369,265
	b. Disbursements	<u>1,845,612,271</u>
	c. Net Cash Flow: (a) - (b)	(1,011,243,006)
3.	Expected Investment Return: [(1) x .0725] + [(2)c x .03625]	2,846,939,110
4.	Expected Actuarial Value of Assets as of December 31, 2001: (1) + (2)c + (3)	41,609,443,269
5.	Market Value of Assets as of December 31, 2001	44,082,657,056
6.	Excess of Market Value over Expected Actuarial Value of Assets: (5) - (4)	2,473,213,787
7.	20% Adjustment towards Market Value: (6) x .20	494,642,757
8.	Actuarial Value of Assets as of December 31, 2001: (4) + (7)	42,104,086,026
9.	Rate of investment return on actuarial value	8.51%
10.	Rate of investment return on market value	(1.90%)

**SCHEDULE B****STATEMENT OF ACTUARIAL ASSUMPTIONS AND METHODS**

Assumptions are based on the experience investigation prepared as of December 31, 1999 and adopted by the Board of Trustees on December 14, 2000.

INTEREST RATE: 7.25% per annum, compounded annually.

SEPARATIONS FROM ACTIVE SERVICE: Representative values of the assumed rates of separation from active service are as follows:

**GENERAL EMPLOYEES**

## Annual Rates of

Age	Withdrawal* and Vesting		Death		Disability		Service Retirement**	
	Male	Female	Male	Female	Male	Female	Male	Female
25	.0800	.0800	.0005	.0003	.0001	.0001		
30	.0800	.0789	.0006	.0003	.0004	.0004		
35	.0637	.0653	.0009	.0005	.0010	.0010		
40	.0435	.0451	.0012	.0007	.0029	.0018		
45	.0350	.0363	.0022	.0010	.0049	.0033		
50	.0450	.0350	.0039	.0017	.0084	.0050	.3000	.3000
55	.0450	.0350	.0061	.0025	.0144	.0088	.3000	.3500
60			.0092	.0042	.0240	.0138	.2000	.2000
65			.0156	.0071			.5000	.5000
69			.0248	.0109			.2500	.2500

**TEACHERS**

## Annual Rates of

Age	Withdrawal* and Vesting		Death		Disability		Service Retirement**	
	Male	Female	Male	Female	Male	Female	Male	Female
25	.0500	.0600	.0004	.0002	.0001	.0002		
30	.0500	.0600	.0005	.0003	.0001	.0003		
35	.0500	.0415	.0007	.0004	.0003	.0006		
40	.0316	.0275	.0009	.0006	.0007	.0010		
45	.0222	.0220	.0014	.0008	.0014	.0018		
50	.0350	.0300	.0025	.0014	.0023	.0032	.2500	.3000
55	.0350	.0300	.0043	.0021	.0047	.0055	.3000	.4000
60			.0066	.0034	.0077	.0102	.2000	.2000
65			.0101	.0058			.4000	.4000
69			.0156	.0087			.2000	.2000

\* Higher rates of withdrawal are used during the first 3 years of membership in the system.

\*\* An additional 20% of general employees and an additional 30% of teachers are assumed to retire in the year when first eligible for unreduced service retirement. Special rates are used for early service retirement.

**LAW ENFORCEMENT OFFICERS**

## Annual Rates of

Age	Withdrawal and Vesting	Death		Disability		Service Retirement*
		Ordinary	Accidental	Ordinary	Accidental	
25	.0769	.00040	.00004	.0032	.0001	
30	.0547	.00051	.00006	.0040	.0003	
35	.0336	.00071	.00008	.0052	.0008	
40	.0223	.00102	.00011	.0068	.0011	
45	.0151	.00174	.00019	.0100	.0010	
50	.0200	.00316	.00035	.0168	.0008	.1500
55		.00509	.00057			.2000
60		.00755	.00084			.1500
65		.01248	.00139			.7500
69		.02001	.00222			.1500

\* An additional 40% are assumed to retire in the year when first eligible for unreduced service retirement. Special rates are used for early service retirement.

**SALARY INCREASES:** Representative values of the assumed annual rates of salary increases are as follows:

Age	Annual Rate of Salary Increase	
	Teachers and General Employees	Law Enforcement Officers
25	10.64%	8.62%
30	11.90	7.79
35	9.01	6.96
40	7.28	6.50
45	6.54	6.29
50	6.21	6.21
55	6.01	6.00
60	5.70	5.95
64	5.48	5.91
65	5.47	--
69	5.45	--

**DEATH AFTER RETIREMENT:** According to the 1983 Group Annuity Mortality Tables set forward one year. For male teachers the table is set back one year. Special mortality tables are used for the period after disability retirement.

**ADMINISTRATIVE EXPENSES:** 0.10% of payroll.

**MARRIAGE ASSUMPTION:** 100% married with the husband four years older than his wife.

**VALUATION METHOD:** Entry age normal cost method. Entry age is established on an individual basis.

**ASSET VALUATION METHOD:** Actuarial value, as developed in Schedule A. The actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected actuarial value of assets, based on the assumed valuation rate of return. The amount recognized each year is 20% of the difference between market value and expected actuarial value.



**SCHEDULE C****SUMMARY OF MAIN BENEFIT AND CONTRIBUTION PROVISIONS**

A summary of the main benefit provisions of the Retirement System and of the sources of revenue from which benefits are paid is presented in the following digest. Items in parentheses in the text are the provisions applicable to law enforcement officers.

"Average final compensation" as used in the summary means the average annual compensation during the four consecutive years of membership service which afford the highest such average. "Membership service" means service represented by regular contributions. "Prior service" means service prior to July 1, 1941 for which credit is allowed. "Creditable service" means the sum of prior service plus membership service. Creditable service may also include certain special purchased service.

**BENEFITS****Service Retirement Allowance****Condition for Allowance**

A service retirement allowance is payable to any member who retires from service after he has attained age 60 and completed 5 years of membership service (age 55 and 5 years of creditable service) or completed 30 years of creditable service.

**Amount of Allowance**

On service retirement on or after age 65 (55), or after age 60 and completion of 25 years of creditable service, or after completion of 30 years of creditable service, a member receives a retirement allowance equal to 1.82% of his average final compensation multiplied by the number of years of his creditable service.

If a member who is not a law enforcement officer has not attained age 65 or has not completed 25 or more years of creditable service at the time of his retirement, his allowance is reduced 1/4 of 1% for each month by which his age at retirement is less than age 65.

In no event will a member whose creditable service commenced on or before June 30, 1963 receive a smaller retirement allowance than he would have received under the benefit provisions of the system in effect on that date.

## Early Service Retirement Allowance

### Condition for Allowance

An early service retirement allowance is payable to any member who retires from service after he has attained age 50 and completed 20 (15) years of creditable service but prior to becoming eligible for a service retirement allowance.

### Amount of Allowance

The member's early service retirement allowance is equal to 1.82% of his average final compensation multiplied by the number of years of his creditable service at his date of retirement reduced by the lesser of:

(i)  $5/12$  ( $1/3$ ) of 1% for each month by which his age is less than 60 (55), plus  $1/4$  of 1% for each month by which his age is less than 65.

(ii) 5% times the difference between 30 years and his creditable service at retirement.

## Deferred Service Retirement Allowance

Any member who separates from service prior to becoming eligible for a service retirement allowance or an early service retirement allowance after completing 5 or more years of membership service and who leaves his total accumulated contributions in the system may receive a deferred retirement allowance, beginning at age 60 (55), computed in the same way as a service retirement allowance, or, if the member has 20 or more years of service, at age 50 computed in the same way as an early service retirement allowance, on the basis of his creditable service and compensation to the date of separation.

## Return of Contributions

Upon the withdrawal of a member without a retirement allowance and upon his request, his contributions are returned to him, together with accumulated regular interest thereon if he has at least 5 years of membership service.

Upon the death of a member before retirement, his contributions, together with the full accumulated regular interest thereon, are paid to his estate or to person(s) designated by the member unless the designated beneficiary, if eligible, elects the survivor's alternate benefit described below.

## Survivor's Alternate Benefit

Upon the death of a member in service who has attained age 60(55) and has completed 5 years of membership (creditable) service or completed 20 years of creditable service, his designated beneficiary may elect to receive a benefit equal to that which would have been payable under the provisions of Option 2 had the member retired on the first day of the month following his death and elected such option, in lieu of the member's accumulated

contributions, provided the member had not instructed the Board of Trustees in writing that he did not wish the alternate benefit to apply.

#### Death After Retirement

Upon the death of a beneficiary who did not retire under an effective election of Option 2 or Option 3, an amount equal to the excess if any, of his accumulated contributions at retirement over the retirement allowance payments received is paid to a designated person or to the beneficiary's estate.

Upon the death of the survivor of a beneficiary who retired under an effective election of Option 2 or Option 3, an amount equal to the excess, if any, of the beneficiary's accumulated contributions at retirement over the total retirement allowance payments received is paid to such other person designated by the beneficiary or to the beneficiary's estate.

#### Optional Arrangements at Retirement

In lieu of the full retirement allowance, any member may elect to receive a reduced retirement allowance equal in value to the full allowance, with the provision that:

Option 1 - A member retiring prior to July 1, 1993, may elect that at his death within 10 years from his retirement date, an amount equal to his accumulated contributions at retirement, less  $1/120$  for each month he has received a retirement allowance, is paid to his estate, or to a person(s) designated by the member, or

Option 2 - At the death of the member his allowance shall be continued throughout the life of such other person as the member shall have designated at the time of his retirement, or

Option 3 - At the death of the member one-half of his allowance shall be continued throughout the life of such other person as the member shall have designated at the time of his retirement.

Option 4 - A member may elect to receive a retirement allowance in such amount that, together with his Social Security benefit, he will receive approximately the same income per annum before and after the earliest age at which he becomes eligible to receive the Social Security benefit.

Option 5 - A member retiring prior to July 1, 1993 may elect to receive a reduced retirement allowance under the provisions of Option 2 or Option 3 in conjunction with the provisions of Option 1.

Option 6 - A member may elect either Option 2 or Option 3 with the added provision that in the event the designated beneficiary predeceases the member, the retirement allowance payable to the member after the designated beneficiary's death shall be equal to the retirement allowance which would have been payable had the member not elected the option.

Post-Retirement Increases  
in Allowances

Future increases in allowances may be granted if the Consumer Price Index rises, provided the liabilities on account of such increases do not increase the total employer rate of contribution.

CONTRIBUTIONS

REGULAR CONTRIBUTIONS

By Members

Each member contributes 6% of his compensation.

By Employers

Employers make annual contributions consisting of a normal contribution and an accrued liability contribution. The normal contribution covers the liability on account of current service and is determined by the actuary after each valuation.

The accrued liability contribution covers the liability on account of service rendered before the establishment of the retirement system and the liability on account of increases in benefits for service rendered prior to the effective date of any amendment.

**SCHEDULE D****TABLE 1**

**THE NUMBER AND ANNUAL COMPENSATION OF  
ACTIVE MEMBERS DISTRIBUTED BY AGE  
AS OF DECEMBER 31, 2001**

Age	Men		Women	
	Number	Amount	Number	Amount
16	1	\$ 43,404		
17	2	27,633	1	\$ 38,149
18	11	69,352	7	24,750
19	52	449,729	65	465,654
20	128	1,328,777	181	1,767,892
21	245	3,345,830	387	4,562,448
22	449	6,843,682	982	11,918,805
23	814	12,810,213	2,362	34,554,177
24	1,244	23,833,421	3,503	66,393,241
25	1,446	30,890,956	3,824	81,283,971
26	1,595	35,531,765	3,977	89,338,795
27	1,757	42,659,888	4,411	103,026,271
28	1,905	49,189,506	4,298	104,966,110
29	1,993	53,582,022	4,535	113,189,930
30	2,194	60,622,638	4,734	121,752,609
31	2,484	69,827,048	5,290	137,380,554
32	2,397	71,763,661	5,045	132,167,539
33	2,300	70,270,057	4,780	127,022,562
34	2,189	68,470,611	4,587	122,209,103
35	2,181	69,564,338	4,507	120,188,056
36	2,291	72,897,471	4,479	118,695,332
37	2,316	75,739,470	4,804	127,303,124
38	2,419	80,150,126	5,046	136,012,344
39	2,472	82,612,290	5,089	139,156,635
40	2,481	84,012,803	5,476	151,827,458
41	2,510	85,414,166	5,800	163,279,565
42	2,549	89,952,757	5,839	168,852,401
43	2,641	92,318,268	5,995	173,940,225
44	2,684	95,856,937	6,365	195,747,953
45	2,790	101,817,049	6,701	212,633,654
46	2,793	103,858,463	6,699	219,734,557
47	2,887	111,713,818	6,878	232,885,960
48	3,035	119,357,841	7,278	253,408,013
49	3,179	129,445,771	7,458	271,143,638
50	3,203	135,166,324	7,274	270,613,846
51	3,061	129,929,516	6,928	261,415,248
52	2,871	125,010,059	6,440	238,702,164
53	2,899	126,424,362	6,027	221,837,014

**TABLE 1**  
**THE NUMBER AND ANNUAL COMPENSATION OF**  
**ACTIVE MEMBERS DISTRIBUTED BY AGE**  
**AS OF DECEMBER 31, 2001**

CONTINUED

Age	Men		Women	
	Number	Amount	Number	Amount
54	2,741	\$ 119,485,840	5,748	\$ 207,740,613
55	2,827	125,929,190	6,001	216,873,541
56	1,925	81,995,608	4,014	142,720,145
57	1,887	81,773,863	3,659	128,338,683
58	1,731	74,957,124	3,439	119,376,124
59	1,729	75,290,289	3,301	111,917,460
60	1,352	57,776,130	2,513	84,498,472
61	1,109	44,531,987	2,023	65,737,240
62	941	39,980,894	1,433	45,170,187
63	708	31,337,595	994	32,785,117
64	494	22,301,949	762	24,069,145
65	368	15,801,540	554	17,259,271
66	250	10,618,082	320	9,523,338
67	189	8,117,075	271	7,991,250
68	171	8,026,979	162	4,587,989
69	119	4,454,451	142	3,822,791
70	101	4,297,916	98	2,358,029
71	89	4,085,953	75	2,217,980
72	60	2,348,518	56	1,287,143
73	53	1,599,590	48	1,142,154
74	36	1,291,883	36	964,991
75	33	1,168,229	24	684,577
76	15	532,667	11	259,328
77	21	620,858	19	381,077
78	4	107,760	8	158,759
79	16	484,479	4	82,030
80	9	348,087	6	126,107
81	8	215,274	3	44,259
82	5	160,445	3	79,114
83	4	230,095	2	98,840
84	3	41,250	2	59,572
85			1	45,524
86			1	26,650
87	1	21,699		
Total	93,467	\$ 3,332,735,321	203,785	\$ 6,161,867,247

**TABLE 2**  
**THE NUMBER AND ANNUAL COMPENSATION OF**  
**ACTIVE MEMBERS DISTRIBUTED BY SERVICE**  
**AS OF DECEMBER 31, 2001**

Years of Service	Men		Women	
	Number	Amount	Number	Amount
0	4,750	\$ 32,402,635	10,043	\$ 67,764,469
1	10,391	226,239,299	23,824	445,238,301
2	7,840	226,448,144	18,797	458,192,200
3	6,507	196,988,628	15,327	392,431,358
4	5,539	176,972,354	12,845	345,048,075
5	4,897	159,070,638	11,920	332,846,537
6	4,226	143,893,202	8,731	254,087,057
7	3,920	135,877,228	8,091	242,529,962
8	4,007	140,303,686	7,135	220,505,440
9	3,032	112,890,268	6,482	208,003,013
10	2,922	108,521,453	5,548	185,246,555
11	2,369	92,601,054	4,779	163,067,460
12	2,716	104,448,194	5,607	190,318,977
13	2,571	98,819,214	5,939	200,405,029
14	2,375	97,694,916	5,223	184,940,646
15	2,021	87,168,962	4,115	152,257,385
16	1,860	82,693,963	4,092	153,791,918
17	2,039	89,626,828	4,238	159,755,984
18	1,923	85,270,903	3,769	146,311,876
19	1,543	70,673,503	2,816	111,813,784
20	1,348	62,084,635	2,712	111,023,030
21	1,257	59,750,711	3,181	125,920,097
22	1,411	67,755,192	3,763	148,710,399
23	1,511	74,186,636	3,998	165,447,686
24	1,531	76,991,274	3,726	158,776,468
25	1,413	73,178,547	3,203	145,063,453
26	1,280	69,082,326	2,868	134,718,864
27	1,318	71,957,614	2,932	143,716,473
28	1,440	80,406,731	2,805	139,599,394
29	967	55,272,662	1,949	98,616,380
30	697	43,766,927	1,185	61,443,340
31	439	29,225,919	709	37,743,032
32	377	26,454,590	486	26,205,952
33	249	17,269,098	302	16,156,985
34	239	16,848,661	184	10,045,273
35	157	11,412,191	156	7,898,094
36	129	9,729,267	91	4,568,434
37	75	5,609,315	59	3,165,743
38	56	4,296,096	47	2,686,305

TABLE 2

**THE NUMBER AND ANNUAL COMPENSATION OF  
ACTIVE MEMBERS DISTRIBUTED BY SERVICE  
AS OF DECEMBER 31, 2001**

CONTINUED

Years of Service	Number	Men		Women	
		Number	Amount	Number	Amount
39	44		\$ 3,216,020	35	\$ 1,906,879
40	33		2,386,330	17	929,176
41	17		1,265,328	21	1,209,014
42	9		719,118	10	443,230
43	6		386,417	3	163,789
44	3		148,140	3	137,842
45	3		232,212	5	392,620
46	3		142,864	3	151,801
47	2		140,592	2	79,714
48	1		34,759		
49	1		33,748	4	168,740
50	1		42,924	3	157,625
51	2		103,405		
52				1	31,914
59				1	33,475
<b>Total</b>	<b>93,467</b>		<b>\$ 3,332,735,321</b>	<b>203,785</b>	<b>\$ 6,161,867,247</b>



TABLE 3

**THE DISTRIBUTION OF THE NUMBER AND ANNUAL  
RETIREMENT ALLOWANCES OF BENEFICIARIES AND  
SURVIVORS BY AGE AS OF DECEMBER 31, 2001**

**SERVICE RETIREMENTS AND  
DEPENDENTS OF DECEASED BENEFICIARIES**

Age	Men		Women	
	Number	Amount	Number	Amount
13	1	\$ 3,677	1	\$ 2,882
14			1	3,338
16	1	15,754		
17	1	17,225	1	8,488
18	2	10,319		
19			1	13,881
20	1	10,161	3	5,384
21			1	9,926
22	1	10,897	3	53,509
23	1	17,987	4	27,186
24	6	72,895	5	36,334
25	2	24,775	2	9,425
26	1	20,716	4	61,279
27	5	24,969	2	31,090
28	2	29,503	6	72,962
29	1	12,194	4	34,856
30	5	25,586	11	91,970
31	10	97,324	7	46,454
32	3	31,476	5	43,747
33	5	85,542	10	87,010
34	6	45,051	7	49,857
35	14	94,738	13	88,284
36	8	89,592	15	196,425
37	11	103,431	15	122,696
38	10	84,809	12	105,773
39	18	134,921	16	99,644
40	15	144,478	22	232,619
41	13	102,101	23	191,084
42	17	126,449	20	141,536
43	13	73,327	23	169,106
44	11	72,850	19	138,344
45	21	183,758	26	247,613
46	15	141,141	36	420,971
47	23	222,214	45	352,036
48	34	486,511	53	592,791
49	54	1,066,849	75	1,215,537

TABLE 3

**THE DISTRIBUTION OF THE NUMBER AND ANNUAL  
RETIREMENT ALLOWANCES OF BENEFICIARIES AND  
SURVIVORS BY AGE AS OF DECEMBER 31, 2001**

**SERVICE RETIREMENTS AND  
DEPENDENTS OF DECEASED BENEFICIARIES**

CONTINUED

Age	Men		Women	
	Number	Amount	Number	Amount
50	141	\$ 2,755,164	224	\$ 3,922,086
51	239	5,201,814	409	8,046,967
52	404	9,956,709	742	16,684,824
53	579	15,569,299	1,059	24,694,217
54	818	22,310,707	1,263	30,431,087
55	923	25,315,303	1,308	31,052,931
56	753	20,759,394	1,145	27,223,715
57	800	23,052,275	1,309	30,842,608
58	913	25,978,521	1,530	36,127,508
59	898	26,208,523	1,530	35,319,901
60	1,009	27,172,642	1,802	38,075,074
61	1,068	28,527,512	2,045	40,613,268
62	1,233	26,874,074	2,330	36,341,756
63	1,373	27,173,921	2,519	37,365,332
64	1,375	26,793,640	2,588	37,931,588
65	1,541	31,574,695	2,700	37,394,598
66	1,533	29,966,364	2,847	39,636,290
67	1,436	27,245,159	2,701	35,996,041
68	1,458	28,097,034	2,485	32,783,529
69	1,446	27,284,954	2,579	33,166,376
70	1,459	28,676,966	2,544	32,781,533
71	1,393	26,252,614	2,490	31,414,823
72	1,297	24,530,594	2,322	29,113,365
73	1,231	22,666,099	2,410	28,768,197
74	1,163	21,336,215	2,227	26,140,266
75	1,072	18,841,795	2,151	24,095,776
76	1,021	17,748,905	2,038	21,633,260
77	901	15,474,065	1,904	20,128,312
78	830	13,402,836	1,725	17,762,624
79	793	13,911,329	1,646	16,994,075
80	755	13,131,690	1,706	17,324,098
81	645	9,170,138	1,513	15,064,383
82	525	7,279,141	1,388	13,283,740
83	437	6,345,536	1,244	11,980,394
84	356	5,046,624	1,108	10,844,255
85	321	4,083,108	991	9,594,276

TABLE 3

**THE DISTRIBUTION OF THE NUMBER AND ANNUAL  
RETIREMENT ALLOWANCES OF BENEFICIARIES AND  
SURVIVORS BY AGE AS OF DECEMBER 31, 2001**

**SERVICE RETIREMENTS AND  
DEPENDENTS OF DECEASED BENEFICIARIES**

CONTINUED

Age	Men		Women	
	Number	Amount	Number	Amount
86	263	\$ 3,112,171	915	\$ 9,660,656
87	237	3,171,942	834	8,486,419
88	181	2,502,397	692	7,200,409
89	136	1,470,451	625	6,933,746
90	100	1,146,763	484	5,246,901
91	84	1,085,188	428	4,702,052
92	69	814,268	358	4,206,237
93	51	444,921	303	3,495,262
94	33	472,080	204	2,419,970
95	20	283,955	166	1,849,180
96	11	155,393	138	1,624,485
97	9	73,273	95	961,993
98	9	125,258	61	654,902
99	4	109,618	46	566,596
100	1	10,856	33	341,538
101	3	12,263	25	198,543
102	1	2,130	12	92,874
103	1	4,802	4	47,981
104	2	17,378	4	29,479
105	1	2,621	1	4,736
106			1	3,772
109			1	11,000
111	1	2,216		
<b>Total</b>	<b>35,687</b>	<b>\$ 724,418,523</b>	<b>70,443</b>	<b>\$ 1,004,315,841</b>
Maximum	8,450	\$ 167,133,167	28,772	\$ 397,022,126
Cash Refund	3,627	61,435,590	12,738	150,982,732
100% J&S	6,170	120,685,123	2,013	19,196,058
50% J&S	3,458	76,528,061	1,857	25,347,022
Soc Sec Level	6,191	145,187,803	12,118	250,162,236
Odd Surv	31	990,917	17	306,651
100% J&S Popup	3,563	74,287,621	1,944	28,365,286
50% J&S Popup	2,605	64,375,277	2,709	48,751,364
Beneficiaries	1,592	13,794,964	8,275	84,182,366

TABLE 4

**THE DISTRIBUTION OF THE NUMBER AND ANNUAL  
RETIREMENT ALLOWANCES OF BENEFICIARIES AND  
SURVIVORS BY AGE AS OF DECEMBER 31, 2001**

Age	Men		Women	
	Number	Amount	Number	Amount
37	1	\$ 6,986		
38	1	12,718	1	\$ 12,851
39	1	14,025		
40	3	36,670	6	72,893
41	1	11,049	8	106,990
42	4	44,684	14	157,853
43	9	138,584	6	91,044
44	25	366,931	16	236,349
45	18	335,374	29	429,207
46	27	530,651	38	748,824
47	35	596,658	45	797,867
48	33	542,320	61	1,164,300
49	38	779,888	85	1,596,673
50	41	861,092	100	2,288,647
51	59	1,100,595	108	2,478,900
52	54	1,116,342	113	2,496,111
53	75	1,570,902	105	2,242,717
54	81	1,684,306	158	3,178,928
55	91	2,012,574	123	2,672,954
56	73	1,424,686	120	2,225,727
57	70	1,307,264	134	2,411,840
58	62	1,161,067	146	2,589,949
59	83	1,637,140	149	2,715,992
60	75	1,284,298	119	1,791,413
61	87	1,478,244	126	1,811,251
62	86	1,444,695	129	1,764,822
63	58	937,825	140	1,879,380
64	70	991,078	113	1,609,980
65	72	1,125,421	109	1,354,949
66	66	1,025,051	93	1,217,158
67	64	912,284	106	1,310,917
68	60	936,164	92	1,108,723
69	54	805,903	81	939,159
70	56	797,346	76	879,203
71	50	697,882	78	862,511
72	58	703,633	100	1,152,450
73	60	739,840	91	893,723

TABLE 4

**THE DISTRIBUTION OF THE NUMBER AND ANNUAL  
RETIREMENT ALLOWANCES OF BENEFICIARIES AND  
SURVIVORS BY AGE AS OF DECEMBER 31, 2001**

**DISABILITY RETIREMENTS**

CONTINUED

Age	Men		Women	
	Number	Amount	Number	Amount
74	59	\$ 752,259	85	\$ 859,418
75	69	799,884	92	928,797
76	53	615,329	89	838,939
77	57	705,591	76	655,834
78	60	816,207	83	754,958
79	57	628,572	71	712,803
80	40	472,526	66	672,892
81	35	519,046	71	694,553
82	40	341,894	48	453,900
83	38	427,252	50	501,863
84	14	149,438	47	562,926
85	14	110,158	33	337,540
86	17	142,872	38	347,950
87	7	112,708	21	166,195
88	7	61,424	26	326,145
89	8	54,817	20	202,581
90	2	14,520	10	135,571
91	2	21,737	5	47,851
92	3	38,694	5	39,367
93			5	64,524
94			4	30,090
95			4	32,806
96			1	12,344
100			1	10,663
<b>Total</b>	<b>2,383</b>	<b>\$ 37,957,098</b>	<b>3,969</b>	<b>\$ 58,682,765</b>
Maximum	1,119	\$ 20,989,100	2,506	\$ 41,604,538
Cash Refund	444	6,159,046	1,040	11,645,604
100% J&S	238	2,481,690	98	942,829
50% J&S	320	4,174,373	130	1,488,721
Soc Sec Level	10	254,930	23	607,633
Odd Surv			2	28,151
100% J&S Popup	73	901,801	42	478,664
50% J&S Popup	179	2,996,158	128	1,886,625