

GENERAL ASSEMBLY RETIREMENT SYSTEM
OF ILLINOIS

ACTUARIAL VALUATION
AS OF JUNE 30, 1994

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October 18, 1994

Board of Trustees
General Assembly Retirement System of Illinois
2101 South Veterans Parkway
P.O. Box 19255
Springfield, Illinois 62794

Re: Actuarial Valuation as of June 30, 1994

Dear Board Members:

I am pleased to submit our actuarial report on the financial position and funding requirements of the General Assembly Retirement System of Illinois based on the actuarial valuation as of June 30, 1994.

The report consists of 12 Sections and 2 Appendices as follows:

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I would be pleased to discuss any aspects of this report with you and other interested persons.

Respectfully submitted,



Sandor Goldstein
Fellow of the Society of Actuaries
Enrolled Actuary No. 93-3402

A. PURPOSE AND SUMMARY

We have carried out an actuarial valuation of the General Assembly Retirement System of Illinois as of June 30, 1994. The purpose of the valuation was to determine the financial position and funding requirements of the retirement system. This report is intended to present the results of the valuation. The results are summarized below:

1. Total actuarial liability	\$110,719,958
2. Actuarial value of assets	40,910,567
3. Unfunded actuarial liability	69,809,391
4. Funded Ratio	36.9%
5. Employer contribution requirement for FY 96 under Public Act 88-0593	\$ 2,400,000
6. Actuarial present value of credited projected benefits	\$110,719,958

B. DATA USED FOR THE VALUATION

Participant Data. The participant data required to carry out the valuation was supplied by the retirement system. The membership of the system as of June 30, 1994, on which the valuation was based, is summarized in Exhibit 1. It can be seen that there were 184 active members, 222 members receiving retirement annuities, 131 members receiving survivor's annuities, and 3 members receiving reversionary annuities included in the valuation. The total active payroll as of June 30, 1994 was \$8,447,869.

Exhibit 1

Summary of Membership Data

1. Number of Members		
(a) Active Members		
(i) Vested		114
(ii) Non-vested		70
(b) Members Receiving		
(i) Retirement Annuities		222
(ii) Survivor's Annuities		131
(iii) Reversionary Annuities		3
(c) Inactive Members		101
2. Annual Salaries (Active Members)		
(a) Total Salary	\$	8,447,869
Average Salary	\$	45,912
3. Total Accumulated Employee Contributions of Active Members	\$	7,236,828
4. Annual Annuity Payments		
(a) Retirement Annuities	\$	5,007,666
(b) Survivor's Annuities		1,216,502
(c) Reversionary Annuities		16,644

Assets. The asset value used for the valuation was based on the asset information contained in the statement of assets as of June 30, 1994 prepared by the system. For purposes of the valuation, the book value of the assets of the system (assets valued at cost), less the amount of liabilities, was used. The resulting actuarial value of assets was \$40,910,567. The development of this value is outlined in Exhibit 2.

Exhibit 2

Actuarial Value of Assets

1. Cash	\$	1,177,781
2. Receivables		3,191
3. Investments - Held in the Illinois State Board of Investment Commingled Fund, at Cost		39,825,825
4. Equipment		<u>12,120</u>
5. Total Assets	\$	41,018,917
6. Liabilities		<u>108,350</u>
7. Actuarial Value of Assets (5-6)	\$	<u>40,910,567</u>

C. RETIREMENT SYSTEM PROVISIONS

The actuarial valuation was based on the provisions of the retirement system in effect as of June 30, 1994 as provided in Article 2 of the Illinois Pension Code. There have been no changes in benefit provisions since the June 30, 1993 valuation. A summary of the principal provisions of the system in effect as of June 30, 1994 is provided in Appendix 1.

D. ACTUARIAL ASSUMPTIONS AND COST METHOD

Actuarial Assumptions

The same actuarial assumptions that were used for the June 30, 1993 actuarial valuation were used for the June 30, 1994 actuarial valuation. These actuarial assumptions were based on an experience analysis of the system over the five-year period 1987-1992. The major actuarial assumptions used for the current valuation are summarized below:

Mortality Rates. The UP-1984 Mortality Table was used for the valuation.

Termination Rates. The following termination rates were used:

<u>Age</u>	<u>Rate of Termination</u>
20 - 54	.060
55 and over	.000

Disability Rates. The following is a sample of the disability rates that were used for the valuation:

<u>Age</u>	<u>Rate of Disability</u>
30	.00057
35	.00064
40	.00083
45	.00115
50	.00170
55 and over	.00000

Retirement Rates. Rates of retirement for each age from 55 to 70 based on the recent experience of the system were used. The following are samples of the rates of retirement that were used:

<u>Age</u>	<u>Rate of Retirement</u>
55	.14
60	.04
65	.04
70	1.00

The above retirement rates are equivalent to an average retirement age of approximately 63.

Salary Increase. A salary increase assumption of 6.5% per year, compounded annually, was used. This 6.5% salary increase assumption can be considered to consist of a general increase component of 5% per year, 4.5% of which is attributable to inflation, and a seniority/merit component of 1.5% per year.

Interest Rate. An interest rate assumption of 8.0% per year, compounded annually, was used. This interest rate assumption can be considered to consist

of an inflation component of 4.5% per year and a real rate of return of 3.5% per year.

Marital Status. It was assumed that 75% of active members will be married at the time of retirement.

Spouse's Age. The age of the spouse was assumed to be 4 years younger than the age of the employee.

Actuarial Cost Method

The projected unit credit actuarial cost method was used for the June 30, 1994 valuation. Actuarial gains and losses are reflected in the unfunded actuarial liability. This is the same actuarial cost method that was used for the June 30, 1993 valuation.

E. ACTUARIAL LIABILITY

The actuarial liability as determined under the valuation for the various classes of members is summarized in Exhibit 3. The total actuarial liability is then compared with the actuarial value of assets in order to arrive at the unfunded actuarial liability. (The actuarial terms used in this report are defined in Appendix 2.)

As of June 30, 1994, the total actuarial liability is \$110,719,958, the actuarial value of assets is \$40,910,567, and the unfunded actuarial liability is

\$69,809,391. The ratio of the actuarial value of assets to the actuarial liability, or funded ratio, is 36.9%.

Exhibit 3

Actuarial Liability As of June 30, 1994

1. Actuarial Liability For Active Members	
(a) Basic retirement annuity	\$ 15,021,147
(b) Annual increase in retirement annuity	4,006,143
(c) Pre-retirement survivor's annuity	2,308,972
(d) Post-retirement survivor's annuity	2,604,143
(e) Withdrawal benefits	4,563,906
(f) Disability benefits	<u>188,928</u>
(g) Total	\$ 28,693,239
2. Actuarial Liability For Members Receiving Benefits	
(a) Retirement annuities	\$ 55,515,167
(b) Survivor annuities (Including reversionary)	<u>10,072,803</u>
(c) Total	\$ 65,587,970
3. Actuarial Liability For Inactive Members	<u>\$ 16,438,749</u>
4. Total Actuarial Liability	\$110,719,958
5. Actuarial Value of Assets	<u>\$ 40,910,567</u>
6. Unfunded Actuarial Liability	<u>\$ 69,809,391</u>
7. Funded Ratio	36.9%

F. EMPLOYER'S NORMAL COST

The employer's share of the normal cost for the year beginning July 1, 1994 is developed in Exhibit 4. For the year beginning July 1, 1994, the total normal cost is determined to be \$2,526,333. Employee contributions are estimated to be \$971,505. The resulting employer's share of the normal cost is \$1,554,828.

contribution, as a percentage of the applicable payroll shall be increased in equal annual increments so that by fiscal year 2011, the State is contributing at the required rate.

Based on the June 30, 1994 actuarial valuation, we have determined the required State contributions under this plan for fiscal year 1996. We have also estimated required contributions for fiscal years 1997 through 2000 as well as for fiscal years 2005 and 2010. The required State contribution rates and amounts are as follows:

<u>Fiscal Year</u>	<u>Projected Payroll</u>	<u>Required State Contribution as a Percent of Payroll</u>	<u>Required State Contribution as a Dollar Amount</u>
1996	\$ 8,825,000	27.19%	\$ 2,400,000
1997	9,269,000	28.95	2,683,000
1998	9,762,000	30.71	2,998,000
1999	10,277,000	32.47	3,337,000
2000	10,752,000	34.23	3,680,000
2005	13,777,000	43.03	5,928,000
2010	17,419,000	51.83	9,028,000

Method of Calculation

The contribution requirements shown above have been determined using the actuarial assumptions, membership data and benefit provisions that were used for the regular actuarial valuation. However, in order to determine the contribution requirements, certain calculations needed to be made that are not normally required in a regular actuarial valuation. Benefit payout requirements, normal costs, and payroll were estimated over the 50-year period from 1996 through 2045

by projecting the membership of the system over the 50-year period, taking into account the impact of new entrants to the system over the 50-year period.

In order to make the required projections, assumptions needed to be made regarding the age and salary distribution of new entrants as well as the size of the active membership of the system. The assumptions regarding the profile of new entrants to the system was based on the recent experience of the system with regard to new entrants. The size of the active membership of the system was assumed to remain constant over the 50-year projection period.

I. RECONCILIATION OF CHANGE IN UNFUNDED LIABILITY

The net actuarial experience during the period July 1, 1993 to June 30, 1994 resulted in an increase in the system's unfunded actuarial liability of \$7,982,348. This increase in unfunded liability is a result of several kinds of gains and losses as illustrated in Exhibit 5.

The employer funding requirement for the year of normal cost plus interest on the unfunded actuarial liability amounted to \$6,249,778, whereas the actual employer contribution for the year amounted to \$2,116,800. Thus, the employer contribution for the year fell short of meeting normal cost plus interest on the unfunded liability by \$4,132,978. Had all aspects of the system's experience been in line with the actuarial assumptions, the unfunded liability would have increased by this amount.

GASB Statement No. 5 requires the disclosure of the actuarial present value of credited projected benefits as the standardized measure of the accrued pension obligation. This measure represents the discounted value of the amount of benefits estimated to be payable in the future as a result of employee service to date, computed by attributing an equal benefit amount to each year of service of the employee.

In Exhibit 6, we have shown the actuarial present value of credited projected benefits in the format prescribed in GASB Statement No. 5. It can be seen that the total actuarial present value of credited projected benefits of \$110,719,958 is the same as the total actuarial liability under the projected unit credit actuarial cost method.

Exhibit 6

Actuarial Present Value of Credited Projected Benefits

1. For members in receipt of benefits and for inactive members	\$ 82,026,719
2. For current employees	
Accumulated employee contributions	7,236,828
Employer-financed vested	12,467,800
Employer-financed non-vested	<u>8,988,611</u>
3. Total actuarial present value of credited projected benefits	\$110,719,958
4. Net assets available for benefits, at cost (Market value is \$ 45,077,910)	<u>\$ 40,910,567</u>
5. Unfunded actuarial present value of credited projected benefits	<u>\$ 69,809,391</u>

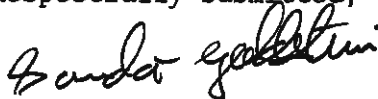
K. PROJECTION OF BENEFITS, CONTRIBUTIONS, and LIABILITIES

Based on the results of the June 30, 1994 valuation and using the actuarial assumptions used for the valuation, we have projected valuation results for a 50-year period commencing with Fiscal Year 1996. We have based State contributions on the contribution requirements in the funding plan established under Public Act 88-0593. The results of our projections are shown in Exhibit 7.

L. CERTIFICATION

This actuarial report has been prepared in accordance with generally accepted actuarial principles and practices and to the best of our knowledge, fairly represents the financial condition of the General Assembly Retirement System of Illinois as of June 30, 1994.

Respectfully submitted,



Sandor Goldstein
Fellow of the Society of Actuaries
Enrolled Actuary 93-3402

EXHIBIT 7

GENERAL ASSEMBLY RETIREMENT SYSTEM OF ILLINOIS
 TWENTY-YEAR PROJECTION OF COSTS, BENEFITS, AND LIABILITIES
 (State Contributions Are Based on Public Act 88-0593)
 (All Dollar Amounts in Millions)

	Fiscal Year Ending 6/30					
	1995	1996	1997	1998	1999	2000
BASIC DATA						
1. Number of Active Members	184	184	184	184	184	184
2. Expected Total Payroll	\$ 8.4	\$ 8.8	\$ 9.3	\$ 9.8	\$ 10.3	\$ 10.8
VALUATION RESULTS						
3. Actuarial Liability (Retired Lives Reserved)	\$113.3 (64.7)	\$116.1 (66.3)	\$119.0 (68.0)	\$122.2 (69.8)	\$125.7 (71.8)	\$129.4 (73.9)
4. Assets (Book)	\$ 39.8	\$ 38.5	\$ 37.2	\$ 35.8	\$ 34.4	\$ 33.1
5. Unfunded Actuarial Liability (Funded Percentage)	\$ 73.5 (35.1)	\$ 77.6 (33.2)	\$ 81.8 (31.3)	\$ 86.4 (29.3)	\$ 91.3 (27.4)	\$ 96.3 (25.6)
6. Annual Normal Cost						
(a) Total	\$ 2.5	\$ 2.7	\$ 2.9	\$ 3.1	\$ 3.3	\$ 3.4
(b) Employee Contributions	1.0	1.0	1.1	1.1	1.2	1.2
(c) Employer's Share (% of Total Payroll)	1.5 (18.40)	1.7 (19.04)	1.8 (19.58)	2.0 (19.95)	2.1 (20.35)	2.2 (20.55)
7. State Contribution (% of Total Payroll)	\$ 2.1 (25.43)	\$ 2.4 (27.19)	\$ 2.7 (28.95)	\$ 3.0 (30.71)	\$ 3.3 (32.47)	\$ 3.7 (34.23)
8. Estimated Total Expenses (Benefits, Refunds and Administrative Expenses)	\$ 7.6	\$ 8.0	\$ 8.2	\$ 8.6	\$ 8.9	\$ 9.2
9. Accumulated Contributions (Actives and Inactives)	\$ 11.2	\$ 11.8	\$ 12.4	\$ 13.1	\$ 13.7	\$ 14.2

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EXHIBIT 7 (CONTINUED)

GENERAL ASSEMBLY RETIREMENT SYSTEM OF ILLINOIS
 TWENTY-YEAR PROJECTION OF COSTS, BENEFITS, AND LIABILITIES
 (State Contributions Are Based on Public Act 88-0593)
 (All Dollar Amounts in Millions)

	Fiscal Year Ending 6/30			
	2005	2010	2020	2045
<u>BASIC DATA</u>				
1. Number of Active Members	184	184	184	184
2. Expected Total Payroll	\$ 13.8	\$ 17.4	\$ 28.0	\$ 94.3
<u>VALUATION RESULTS</u>				
3. Actuarial Liability (Retired Lives Reserved)	\$151.4 (86.4)	\$181.3 (103.6)	\$276.6 (158.2)	\$444.0 (253.9)
4. Assets (Book)	\$ 28.4	\$ 32.0	\$ 74.1	\$862.6
5. Unfunded Actuarial Liability (Funded Percentage)	\$123.0 (18.7)	\$149.3 (17.6)	\$202.5 (26.8)	\$ 95.9 (90.0)
6. Annual Normal Cost				
(a) Total	\$ 4.4	\$ 5.6	\$ 9.1	\$ 30.8
(b) Employee Contributions	1.6	2.0	3.2	10.8
(c) Employer's Share (% of Total Payroll)	2.8 (20.77)	3.6 (20.91)	5.9 (21.04)	20.0 (21.22)
7. State Contribution (% of Total Payroll)	\$ 5.9 (43.03)	\$ 9.0 (51.83)	\$ 14.5 (51.83)	\$ 48.9 (51.83)
8. Estimated Total Expenses (Benefits, Refunds and Administrative Expenses)	\$ 10.5	\$ 12.1	\$ 17.4	\$ 48.6
9. Accumulated Contributions (Actives and Inactives)	\$ 18.4	\$ 23.5	\$ 37.2	\$125.8

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Appendix 1

Summary of Principal Provisions

1. Participation. A person eligible for membership must participate in the system as a condition of employment unless an "Election Not to Participate" is filed within 24 months from the date of assuming office.
2. Member Contributions. All members of the system are required to contribute to the system the following percentage of their salaries:

Retirement Annuity	8.5%
Automatic Annuity Increase	1.0
Survivor's Annuity	<u>2.0</u>
Total	11.5%

3. Retirement Annuity - Eligibility. A member who has at least 8 years of creditable service is entitled to a retirement annuity upon attainment of age 55. A member with at least 4 years of service but less than 8 years of service is entitled to a retirement annuity upon attainment of age 62.

A member with at least 8 years of service who becomes disabled while in service is entitled to a retirement annuity regardless of age.

4. Retirement Annuity - Amount. The retirement annuity is determined according to the following formula based upon the member's final rate of salary:

3.0% for each of the first 4 years of service, plus
3.5% for each of the next 2 years of service, plus
4.0% for each of the next 2 years of service, plus
4.5% for each of the next 4 years of service, plus
5.0% for each year of service in excess of 12

The maximum retirement annuity is 85% of the final rate of salary.

5. Automatic Increase In Retirement Annuity. (a) Annual automatic increases of 3% of the current amount of retirement annuity are provided. The initial increase is effective in the month of January or July of the year next following the year in which the first anniversary of retirement occurs, but in no event prior to attainment of age 60.

(b) Beginning January 1, 1990, for participants who remain in service after attaining 20 years of creditable service, 3% annual automatic increases begin to accrue on January 1 next following the date the participant attains age 55 or completes 20 years of creditable service, whichever occurs later. For any person who has service credit for the entire period from January 15, 1969 through December 31, 1992, the increases shall accrue from age 50 instead of age 55. However, such increases shall not become payable until January 1 next following the first anniversary of retirement, but in no event prior to attainment of age 60.

6. Survivor's Annuity - Eligibility. A surviving spouse without children is eligible for survivor benefits at age 50 or over provided marriage to the member had been in effect for at least 1 year immediately prior to the member's death.

A surviving spouse with unmarried eligible children of the member is eligible for a survivor's annuity benefit at any age provided the above marriage requirements have been met. When all children are disqualified because of death, marriage or attainment of age 18 or age 22 in the case of a full-time student, the spouse's benefit is suspended if the spouse is under age 50 until the attainment of such age.

An unmarried child of the member under age 18 or under age 22 and a full-time student or over age 18 and disabled may qualify for the survivor's annuity if there is no surviving spouse or if the spouse remarries prior to attainment of age 55 or dies.

If the member dies in service as a member, the member must have at least 2 years of service credit for survivor's annuity eligibility. If death occurs after termination of service but before retirement, the deceased member must have at least 8 years of service credit for survivor's annuity eligibility.

7. Survivor's Annuity - Amount. (a) A surviving spouse is entitled to a survivor's annuity of $66 \frac{2}{3}\%$ of the amount of retirement annuity to which the member was entitled on the date of death, without regard to whether the member had attained age 55 as of the time of death, subject to a minimum payment of 10% of salary.

(b) If a surviving spouse has in his or her care eligible children of the member, the survivor's annuity shall be the greater of the following:

(1) $66 \frac{2}{3}\%$ of the amount of retirement annuity to which the member was entitled on the date of death, or (2) 30% of the member's salary increased by 10% of salary on account of each eligible child, subject to a total payment for the surviving spouse and children of 50% of salary. If only unmarried children survive, each such child shall be entitled to an annuity of 20% of salary, subject to a maximum total payment for all children of 50% of salary.

(c) Upon the death of a member after termination of service, or upon the death of an annuitant, the maximum total payment to a surviving spouse and eligible children, or eligible children alone if there is no surviving spouse, shall be 75% of the retirement annuity to which the member or annuitant was entitled.

(d) Survivor's annuities are subject to annual automatic increases of 3% of the current amount of annuity.

(e) The minimum survivor's annuity provided by the system is \$300 per month.

(f) In the case of a proportional survivor's annuity under the Retirement Systems Reciprocal Act, if the amount payable by the system on January 1, 1993 is less than \$300 per month, the amount shall be increased as of that date by \$2 per month for each full year elapsed since the annuity began.

8. Refund of Contributions. Upon termination of service, a member is entitled to a refund of his total contributions without interest.

If unmarried at the time of retirement, a member is entitled to a refund of his or her contributions for the survivor's annuity.

Appendix 2

Glossary of Terms used in Report

1. Actuarial Present Value. The value of an amount or series of amounts payable at various times, determined as of a given date by the application of a particular set of actuarial assumptions.
2. Actuarial Cost Method or Funding Method. A procedure for determining the actuarial present value of pension plan benefits and for determining an actuarially equivalent allocation of such value to time periods, usually in the form of a normal cost and an actuarial accrued liability.
3. Normal Cost. That portion of the actuarial present value of pension plan benefits which is allocated to a valuation year by the actuarial cost method.
4. Actuarial Liability or Accrued Liability. That portion, as determined by a particular actuarial cost method, of the actuarial present value of pension benefits which is not provided for by future normal costs.
5. Actuarial Value of Assets. The value assigned by the actuary to the assets of the pension plan for purposes of an actuarial valuation.
6. Unfunded Actuarial Liability. The excess of the actuarial liability over the actuarial value of assets.
7. Projected Unit Credit Actuarial Cost Method. A cost method under which the projected benefits of each individual included in an actuarial valuation are allocated by a consistent formula to valuation years. The actuarial present value of benefits allocated to a valuation year is called the normal cost. The actuarial present value of benefits allocated to all periods prior to a valuation year is called the actuarial liability.

Under this method, the actuarial gains (losses), as they occur, generally reduce (increase) the unfunded actuarial liability.
8. Actuarial Assumptions. Assumptions as to future events affecting pension costs.
9. Actuarial Valuation. The determination, as of a valuation date, of the normal cost, actuarial liability, actuarial value of assets, and related actuarial present values for a pension plan.