

GOLDSTEIN & ASSOCIATES
Consulting Actuaries

SPRINGFIELD FIREFIGHTERS' PENSION FUND

ACTUARIAL VALUATION
AS OF FEBRUARY 28, 1993

GOLDSTEIN & ASSOCIATES
Consulting Actuaries

ONE NORTH LASALLE STREET SUITE 4220
CHICAGO, ILLINOIS 60602
PHONE (312) 726-5877 FAX (312) 726-4323

June 22, 1993

Mr. Carl L. Forn
Director of Budget & Management
City of Springfield
Room 210 - Municipal Building
Springfield, Illinois 62701

Re: Actuarial Valuation of Springfield Firefighters' Pension Fund

Dear Mr. Forn:

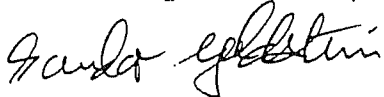
I am pleased to submit my actuarial report on an actuarial valuation of the Springfield Firefighters' Pension Fund as of February 28, 1993.

The report consists of 10 Sections and 2 Appendices as follows:

	<u>Page No.</u>
Section A - Purpose and Summary	1
Section B - Data Used For Valuation	1
Section C - Fund Provisions	3
Section D - Actuarial Assumptions and Cost Method	3
Section E - Actuarial Liability	4
Section F - Reconciliation of Change in Unfunded Liability	5
Section G - Normal Cost	7
Section H - Annual Actuarial Requirements	7
Section I - Present Value of Credited Projected Benefits	8
Section J - Certification	10
Appendix 1 - Summary of Principal Provisions	11
Appendix 2 - Glossary of Terms	13

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

GOLDSTEIN & ASSOCIATES

Consulting Actuaries

A. PURPOSE AND SUMMARY

We have carried out an actuarial valuation of the Springfield Firefighters' Pension Fund as of February 28, 1993. The purpose of the valuation was to determine the financial position and the annual actuarial requirements of the pension fund. This report is intended to present the results of the valuation. The results of the valuation are summarized below:

1. Total actuarial liability	\$ 49,577,140
2. Actuarial value of assets	\$ 45,862,524
3. Unfunded actuarial liability	\$ 3,714,616
4. Funded ratio	92.5%
5. Total normal cost	\$ 1,938,959
6. Annual actuarial requirement for year beginning March 1, 1993	\$ 2,115,807
7. Amount of tax to be levied by City so that total revenue will be sufficient to meet annual actuarial requirement	\$ 1,500,979
8. Actuarial present value of credited projected benefits	\$ 50,066,085

B. DATA USED FOR THE VALUATION

Participation Data. The participant data required to carry out the valuation was supplied by the pension fund. The participant data for the pension fund as of February 28, 1993 on which the valuation is based is summarized in Exhibit 1. It can be seen that there were 194 active members and 148 members receiving benefits. The total active payroll as of February 28, 1993 was \$7,452,458.

GOLDSTEIN & ASSOCIATES
Consulting Actuaries

Exhibit 1

Summary of Participant Data

1. Number of Members		
(a) Active Members		194
(b) Members Receiving		
(i) Retirement Pensions		74
(ii) Survivor Pensions		47
(iii) Disability Pensions		<u>27</u>
(c) Total		<u>342</u>
2. Annual Salaries		
(a) Total Salary	\$ 7,452,458	
(b) Average Salary		38,415
3. Total Accumulated Contributions of Contributors	\$ 4,933,890	
4. Annual Benefit Payments Currently Being Made		
(a) Retirement Pensions		1,404,652
(b) Survivor Pensions		226,789
(c) Disability Pensions		<u>431,218</u>

Assets. The asset values used for the valuation were based on the asset information contained in the financial statements of the pension fund as of February 28, 1993. For purposes of the valuation, the book value of the assets of the fund less the amount of liabilities was used. The resulting actuarial value of assets is \$45,862,524. The development of this value is outlined in Exhibit 2.

Exhibit 2

Actuarial Value of Assets

1. Cash	\$ 1,380
2. Receivables	2,073,145
3. Investments at Cost or Amortized Cost	<u>43,787,999</u>
4. Total Assets	\$ 45,862,524
5. Liabilities	<u>0</u>
6. Actuarial Value of Assets (4-5)	<u>\$ 45,862,524</u>

GOLDSTEIN & ASSOCIATES
Consulting Actuaries

C. FUND PROVISIONS

Our valuation was based on the provisions of the fund in effect as of February 28, 1993 as provided in Article 4 of the Illinois Pension Code. Senate Bill 1650, which was signed into law on January 25, 1993 as Public Act 87-1265, made certain changes in the benefit provisions of the fund. The most significant changes were as follows: (1) the surviving spouse's pension was increased from 40% of salary to 54% of salary, and (2) the minimum retirement and surviving spouse's pension was increased from \$400 to \$475 per month. A summary of the principal provisions of the fund is provided in Appendix 1.

D. ACTUARIAL ASSUMPTIONS AND COST METHOD

Based on an analysis of the recent experience of the fund as well as the experience under approximately 50 other firefighters' pension funds in Illinois, we have made a number of changes in the actuarial assumptions for the February 28, 1993 valuation from the assumptions used for the February 28, 1992 valuation. These changes are as follows: (1) The mortality rate assumption was changed from the UP-1984 Mortality Table, rated up 1 year; (2) the termination rates were decreased to bring them more in line with the recent experience under the fund as well as the experience under other Illinois firefighters' pension funds; (3) disability rates were increased to bring them more in line with the recent experience under the fund as well as the experience under other Illinois firefighters' pension funds; and (4) the salary increase assumption was reduced from 6.0% per year to 5.5% per year to bring it more in line with the recent experience of the fund. We believe that these revised assumptions provide a better representation of anticipated experience under the fund.

The actuarial assumptions used for the February 28, 1993 valuation are outlined below:

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

Termination Rates. The following is a sample of the termination rates that were used:

<u>Age</u>	<u>Rate of Termination</u>
25	.0250
30	.0146
35	.0079
40	.0042
45	.0029
50	.0000

GOLDSTEIN & ASSOCIATES
Consulting Actuaries

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

<u>Age</u>	<u>Rate of Disability</u>
25	.0009
30	.0025
35	.0046
40	.0065
45	.0097
50	.0166
55	.0314

Retirement Rates. Rates of retirement for each age from 50 to 65. The following is a sample of the retirement rates that were used for the valuation:

<u>Age</u>	<u>Rate of Retirement</u>
50	.20
55	.05
60	.15
65	1.00

Salary Progression. 5.5% per year, compounded annually.

Investment Return Rate. 8.0% per year, compounded annually.

Marital Status. 85% of participants were assumed to be married.

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

Actuarial Value of Assets. The book value of the assets of the fund was used.

Actuarial Cost Method. The entry age actuarial cost method was used with costs allocated on the basis of earnings.

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.)

GOLDSTEIN & ASSOCIATES
Consulting Actuaries

As of February 28, 1993 the total actuarial liability is \$49,577,140 the actuarial value of assets is \$45,862,524, and the unfunded actuarial liability is \$3,714,616. The ratio of the actuarial value of assets to the actuarial liability, or funded ratio, is 92.5%

Exhibit 3

Actuarial Liability as of February 28, 1993

1. Actuarial Liability For Members Receiving Benefits	
(a) Retirement Pensions	\$ 16,384,307
(b) Survivor Pensions	1,795,012
(c) Disability Pensions	<u>5,760,354</u>
(d) Total	\$ 23,939,673
2. Actuarial Liability For Active Members	25,637,467
3. Actuarial Liability For Inactive Members	0
4. Total Actuarial Liability	<u>\$ 49,577,140</u>
5. Actuarial Value of Assets	<u>\$ 45,862,524</u>
6. Unfunded Actuarial Liability	<u>\$ 3,714,616</u>
7. Funded Ratio	92.5%

F. RECONCILIATION OF CHANGE IN UNFUNDED LIABILITY

The net actuarial experience during the period March 1, 1992 to February 28, 1993 resulted in an increase in the fund's unfunded liability of \$424,238. This increase in unfunded liability is a result of several kinds of gains and losses. The financial effect of the most significant gains and losses is illustrated in Exhibit 4.

The net rate of investment return earned by the fund during the year was approximately 7.8%, in comparison to the assumed rate of 8.0%. This resulted in an increase in the unfunded liability of \$69,957. Salaries increased at an average rate of approximately 5.83% during the year, in comparison to the assumed rate of 6.0%. This resulted in a decrease in the unfunded liability of \$43,548.

The annual actuarial requirement of the fund for the year was \$1,473,512, whereas the actual employer contribution was \$1,502,491, resulting in a decrease in the unfunded liability of \$28,979.

GOLDSTEIN & ASSOCIATES
Consulting Actuaries

For the February 28, 1993 valuation, some changes were made in the calculation procedures used to determine the actuarial liability for survivor benefits. These changes in calculation procedures together with the benefit increases enacted during the past year had the combined impact of reducing the unfunded liability by \$612,342.

The changes made in the actuarial assumptions used for the February 28, 1993 valuation had the impact of increasing the unfunded liability by \$492,128. The various other aspects of the fund's experience resulted in a net increase in the unfunded liability of \$547,022. The aggregate financial experience of the fund resulted in an increase in the unfunded liability of \$424,238.

Exhibit 4

Reconciliation of Change in Unfunded Actuarial Liability
Over the period March 1, 1992 to February 28, 1993

1. Unfunded Liability as of March 1, 1992	\$ 3,290,378
2. Increase in Unfunded Liability Due to Investment Return Lower Than Assumed	69,597
3. Decrease in Unfunded Liability Due to Salary Increases Lower Than Assumed	43,548
4. Decrease in Unfunded Liability Due to Employer Contribution Larger Than Annual Actuarial Requirement	28,879
5. Decrease in Unfunded Liability Due to Change in Calculation Procedures For Survivor Benefits Combined With Benefit Increases	612,342
6. Increase in Unfunded Liability Due to Changes in Actuarial Assumptions	492,128
7. Increase in Unfunded Liability Due to Other Sources	547,022
8. Net Increase in Unfunded Liability for the Year (2-3-4-5+6+7)	424,238
9. Unfunded Liability as of February 28, 1993 (1+8)	\$ 3,714,616

GOLDSTEIN & ASSOCIATES
Consulting Actuaries

G. NORMAL COST

The normal cost for the year beginning March 1, 1993 is developed in Exhibit 5. For the year beginning March 1, 1993, the total normal cost is estimated to be \$1,938,959, which can be expressed as 26.02% of payroll.

Exhibit 5

Normal Cost For Year Beginning March 1, 1993

	<u>Dollar Amount</u>	<u>Per Cent of Payroll</u>
1. Basic Retirement Pension	\$ 775,866	10.41%
2. Annual Increases in Pension	238,682	3.20
3. Survivor's Pension	270,468	3.63
4. Disability Pension	606,520	8.14
5. Refunds	10,561	.14
6. Administrative Expenses	<u>36,862</u>	<u>.50</u>
7. Total Normal Cost	\$ 1,938,959	26.02%

Note. The above normal cost figures have been adjusted to include interest to the end of the year, as payments will not be made until the end of the year. The figures are based on a total active payroll of \$7,452,458 as of March 1, 1993.

H. ANNUAL ACTUARIAL REQUIREMENTS FOR YEAR BEGINNING MARCH 1, 1993

According to Section 4-118 of the Illinois Pension Code, the city council shall annually levy a tax which, when added to employee contributions, will produce an amount sufficient to meet the annual actuarial requirements of the pension fund. Section 4-118 defines the annual actuarial requirements of the pension fund to be equal to (1) the normal cost of the pension fund, plus (2) the annual amount required to amortize the fund's unfunded actuarial liability over a period of 40 years from July 1, 1993 as a level percent of payroll. Public Act 87-1265 changed the amortization period from 40 years from January 1, 1980 to 40 years from July 1, 1993 and changed the amortization method from equal annual payments to a level percent of payroll.

The annual actuarial requirements of the pension fund for the year beginning March 1, 1993 and the amount of tax to be levied for the year are developed in Exhibit 6. As can be seen from Exhibit 6, for the year beginning March 1, 1993, the annual actuarial requirements of the pension fund amount to \$2,115,807, or 28.39% of payroll. Employee contributions for the year are estimated to be \$614,828, or 8.25% of payroll. The amount of tax to be levied by the City so that total revenues will be sufficient to meet the annual actuarial requirement is therefore \$1,500,979, or 20.14% of payroll.

GOLDSTEIN & ASSOCIATES
Consulting Actuaries

Exhibit 6

Annual Actuarial Requirements for Year Beginning March 1, 1993

	<u>Annual Amount</u>	<u>Per Cent of Payroll</u>
1. Total Normal Cost	\$ 1,938,959	26.02%
2. Annual Amount Required to Amortize Unfunded Liability Over 40 Years From July 1, 1993 as a level percent of payroll	<u>176,848</u>	<u>2.37%</u>
3. Annual Actuarial Requirement for Year Beginning March 1, 1993 (1+2)	\$ 2,115,807	28.39%
4. Employee Contributions for Year	<u>614,828</u>	<u>8.25%</u>
5. Amount of Tax to be Levied by City so that Total Revenue will be Sufficient to Meet Annual Actuarial Requirements (3-4)	<u>\$ 1,500,979</u>	<u>20.14%</u>

Note. The above figures have been adjusted to include interest to the end of the year, as payments will not be made until the end of the year.

I. ACTUARIAL PRESENT VALUE OF CREDITED PROJECTED BENEFITS

Governmental Accounting Standards Board (GASB) Statement No. 5, entitled Disclosure of Pension Information by Public Employee Retirement Systems and State and Local Governmental Employers, establishes standards of disclosure of pension information by public employee retirement systems.

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 to the employee.

We have therefore calculated the actuarial present value of credited projected benefits as part of the actuarial valuation. The results of our calculations are shown in Exhibit 7. It can be seen from Exhibit 7 that the actuarial present value of credited projected benefits as of February 28, 1993 amounts to \$50,066,085, and the unfunded actuarial present value of credited projected benefits amounts to \$4,203,561.

Impact of Benefit Changes and Changes in Actuarial Assumptions. We have estimated that the benefit changes enacted under Public Act 87-1265 in combination with the changes made in the method of calculation of liabilities for survivor benefits and automatic increases had the impact of reducing the actuarial present value of credited projected benefits by \$466,080. We have

GOLDSTEIN & ASSOCIATES
Consulting Actuaries

estimated that the changes made in the actuarial assumptions used for the February 28, 1993 valuation had the impact of increasing the actuarial present value of credited projected benefits by \$1,249,263.

Exhibit 7

Actuarial Present Value of Credited Projected Benefits

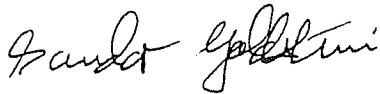
1. For Members in Receipt of Benefits and for Inactive Members	\$ 23,939,673
2. For Current Employees	
Accumulated Employee Contributions	4,933,890
Employer-Financed Vested	11,582,352
Employer-Financed Nonvested	<u>9,610,170</u>
3. Total Actuarial Present Value of Credited Projected Benefits	\$ 50,066,085
4. Net Assets Available for Benefits, at Cost	<u>\$ 45,862,524</u>
5. Unfunded Actuarial Present Value of Credited Projected Benefits	\$ 4,203,561

GOLDSTEIN & ASSOCIATES
Consulting Actuaries

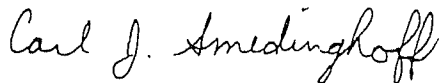
J. CERTIFICATION

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 Springfield Firefighters' Pension Fund as of February 28, 1993

Respectfully submitted,



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



Carl J. Smedinghoff
Associate of the Society of Actuaries

GOLDSTEIN & ASSOCIATES
Consulting Actuaries

Appendix 1

Summary of Principal Provisions

Pension Benefits

A firefighter age 50 or over who has at least 20 years of creditable service and is no longer in service as a firefighter is entitled to a monthly pension of 1/2 of the monthly salary attached to the firefighters' rank at the date of retirement. The pension is increased 1/12 of 2% of such monthly salary for each additional month over 20 years of service through 30 years of service, and 1/12 of 1% of such monthly salary for each additional month over 30 years of service, to a maximum of 75% of such monthly salary.

Separation Benefits

A firefighter who is separated from service having at least 10 years but less than 20 years of creditable service is entitled upon attainment of age 60 to a pension based on the monthly salary attached to his or her rank in the fire service on the date of separation of service, according to the following schedule:

- For 10 years of service, 15.0% of salary;
- For 11 years of service, 17.6% of salary;
- For 12 years of service, 20.4% of salary;
- For 13 years of service, 23.4% of salary;
- For 14 years of service, 26.6% of salary;
- For 15 years of service, 30.0% of salary;
- For 16 years of service, 33.6% of salary;
- For 17 years of service, 37.4% of salary;
- For 18 years of service, 41.4% of salary;
- For 19 years of service, 45.6% of salary;

Annual Increases In Pension

The monthly pension of a firefighter who retires after January 1, 1977, shall, upon either the first of the month following the first anniversary of the date of retirement, if 55 years of age or over at retirement date, or upon the first day of the month following attainment of age 55 if it occurs after the first anniversary of retirement, be increased by 3% of the originally granted monthly pension for each full year that has elapsed since the pension began, and by an additional 3% in each January thereafter.

The monthly pension of a firefighter who is receiving a disability pension shall be increased in January of the year following the year the firefighter attains age 60 by 3% of the originally granted monthly pension for each year that pension payments have been made. In each January thereafter, the firefighter shall receive an additional increase of 3% of the original monthly pension.

GOLDSTEIN & ASSOCIATES
Consulting Actuaries

Disability Pension

If a firefighter, as a result of an act of duty, or an occupational disease, is found to be disabled for service in the fire department, the firefighter shall be granted a disability pension of 65% of the salary attached to the rank of the firefighter at the date of removal from the municipality's payroll. If the disability is the result of any cause, and the firefighter has a minimum of 7 years of creditable service, the disability pension is 50% of monthly salary.

In addition, any firefighter disabled by an act of duty or an occupational disease is entitled to receive a child's disability benefit of \$20 a month for each dependent minor child, provided that the total benefits received does not exceed 75% of the salary he or she was receiving at the date of removal from the municipality's payroll.

Pension To Survivors

Upon the death of an active, disabled, or retired firefighter, his or her surviving spouse, children, or dependent parents, are entitled to a survivor's pension as follows: To the surviving spouse, a monthly pension of 54% of the firefighter's monthly salary, and to the guardian of each minor child, 12% of such monthly salary for each child, until attainment of age 18.

Contributions By Firefighter

Firefighters are required to contribute to the pension fund 8 1/4% of their salary as a condition of participation in the pension fund.

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 Accrued 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. Entry Age Actuarial Cost Method. A method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age. The portion of this actuarial present value allocated to a valuation year is called the normal cost. The portion of this actuarial present value not provided at a valuation date by the actuarial present value of future normal costs is called the 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 the pension plan.
10. Accrued Benefit or Accumulated Plan Benefits. The amount of an individual's benefit as of a specific date determined in accordance with the terms of a pension plan and based on compensation and service to that date.
11. Vested Benefits. Benefits that are not contingent on an employee's future service.