Firefighters' Pension System of the City of Kansas City, Missouri

*Actuarial Valuation and Review as of May 1, 2002*

*The Segal Company*
*6300 S. Syracuse Way, Suite 750*
*Englewood, CO 80111*
*(303) 714-9900*

*September 17, 2002*

*Board of Trustees*
*Firefighters' Pension System of the City of Kansas City, Missouri*
*Kansas City, Missouri*

*Dear Board Members:*

*We are pleased to submit this Actuarial Valuation and Review as of May 1, 2002. It summarizes the actuarial data used in the valuation, establishes the funding requirements for fiscal 2002 and analyzes the preceding year's experience.*

*The census and financial information on which our calculations were based was prepared by the Pension System. That assistance is gratefully acknowledged. The actuarial calculations were completed under our supervision.*

*This actuarial valuation has been completed in accordance with generally accepted actuarial principles and practices. To the best of our knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the System.*

*We look forward to reviewing this report at your next meeting and to answering any questions.*

*Sincerely,*

*THE SEGAL COMPANY*

*By:*

*Leslie L. Thompson, ASA, MAAA, EA*
*Senior Vice President and Consulting Actuary*

*Wally Malles, ASA, MAAA, EA*

## SECTION 1

### VALUATION SUMMARY



## SECTION 2

### VALUATION RESULTS



## SECTION 3

### SUPPLEMENTARY INFORMATION



## SECTION 4

### REPORTING INFORMATION

**Purpose:**
This report has been prepared by The Segal Company to present a valuation of the Firefighters' Pension System of the City of Kansas City, Missouri as of May 1, 2002. The valuation was performed to determine if the assets and contributions are sufficient to provide the prescribed benefits. The contribution requirements presented in this report are based on:

- The benefit provisions of the Retirement System, as administered by the Board;
- The characteristics of covered active members, inactive vested members, and pensioners and beneficiaries as of May 1, 2002, provided by the Board;
- The assets of the Plan as of April 30, 2002, provided by the Pension System;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc.

**Significant Issues in Valuation Year:**

The effective amortization period (the amortization of the unfunded actuarial accrued liability) is 33 years as of May 1, 2002. Last year the effective amortization period was 11 years. This increase is primarily due to less than anticipated investment return and greater than anticipated salary increases, resulting in actuarial losses.

The City normal cost is 12.96% of payroll. The amount available for amortization is 6.64% of payroll. The scheduled City contribution of 19.6% of payroll is sufficient to meet the normal cost and amortize the current unfunded actuarial accrued liability in 33 years.

Due to improvements in mortality, we suggest consideration be given to updating the mortality table used in the determination of healthy life valuation liabilities. The current mortality table in use is the 1971 Group Annuity Mortality Table with 5% of deaths assumed to be Duty related.

The increase in the contribution requirements the past two years was partially due to the increase in salaries being greater than expected. For active members with two or more years of service, annual salary increases were 15.9% for the current valuation year and 12.4% for the prior valuation year. If salaries increased as expected during the current valuation year, the effective amortization period would have been 26 years. If this trend is to continue, consideration should be given to increasing the assumed rates of salary increase.

The excess of the actuarial accrued liability over the actuarial value of assets increased from $20.3 million as of May 1, 2001 to $45.1 million as of May 1, 2002. This increase is primarily due to less than anticipated investment return and greater than anticipated salary increases in the prior year.

The actuarial value of assets is less than market value of assets as of April 30, 2002. The actuarial value of assets as a percentage of market value of assets is 95.5% as of April 30, 2002, compared to 94.4% as of the prior year.

The actuarial valuation report as of May 1, 2002 is based on financial information as of that date. Declines in the value of assets subsequent to that date, to the extent that they exist, are not reflected. Such declines, if they exist, will increase the future actuarially calculated costs of the System.

If the actuarial value of assets as of April 30, 2002 had been 10% lower as of the actuarial valuation date, *i.e.* $282,257,754, then the System would have a larger excess of the actuarial accrued liability over the actuarial value of assets and the effective amortization period would become an infinite number of years. Therefore, the expected City and employee contributions would not be sufficient to pay the normal cost and amortize the current unfunded actuarial accrued liability.

There were no changes in plan provisions or actuarial assumptions since the prior actuarial valuation.

| Summary of Key Valuation Results | May 1, 2002 | May 1, 2001 |
|---|---|---|
| **Contributions:** | | |
| Scheduled * | $8,172,986 | $7,065,203 |
| Actual | -- | 7,709,082 |
| **Funding Elements:** | | |
| Normal cost, including employee contributions ** | $9,003,485 | $7,778,926 |
| Market value of assets | 328,458,377 | 332,969,672 |
| Actuarial value of assets | 313,619,727 | 314,419,934 |
| Actuarial accrued liability | 358,688,291 | 334,755,464 |
| Unfunded/(Overfunded) actuarial accrued liability | 45,068,564 | 20,335,530 |
| Funding period | 33 years | 11 years |
| **GASB 25/27:** | | |
| Annual required contribution | $8,172,986*** | $7,709,082 |
| Actual contributions | -- | 7,709,082 |
| Percentage contributed | -- | 100.0% |
| Funded ratio | 87.4% | 93.9% |
| Covered payroll | 41,698,908 | 36,046,956 |
| **Demographic Data:** | | |
| Number of pensioners & beneficiaries | 819 | 808 |
| Number of refunds due | 5 | 5 |
| Number of active members | 801 | 752 |
| Total anticipated 2002 payroll | $41,698,908 | $36,046,956 |
| Average anticipated 2002 payroll | $52,059 | $47,935 |

** Scheduled City contributions are 19.6% of valuation payroll.*
*** Excludes adjustment for timing.*
**** Estimated at 19.6% of valuation payroll.*

## A. MEMBER DATA

The Actuarial Valuation and Review considers the number and demographics of covered members, including active members, vested terminated members, pensioners and beneficiaries.

This section presents a summary of significant statistical data on these groups.

More detailed information for this valuation year and the preceding valuation can be found in Section 3, Exhibits A, B, and C.

*A historical perspective of how the member population has changed over the past ten valuations can be seen in this chart.*

**CHART 1**

**Member Population: 1993 – 2002**

| Year Ended April 30 | Active Members | Vested Terminated Members* | Pensioners and Beneficiaries | Ratio of Non-Actives to Actives |
|---|---|---|---|---|
| 1993 | 777 | -- | 681 | 0.88 |
| 1994 | 774 | 1 | 724 | 0.94 |
| 1995 | 771 | -- | 752 | 0.98 |
| 1996 | 772 | -- | 759 | 0.98 |
| 1997 | 774 | -- | 764 | 0.99 |
| 1998 | 761 | -- | 781 | 1.03 |
| 1999 | 786 | 1 | 782 | 1.00 |
| 2000 | 780 | -- | 799 | 1.02 |
| 2001 | 752 | -- | 808 | 1.07 |
| 2002 | 801 | -- | 819 | 1.02 |

**Excludes terminated members due a refund of employee contributions.*

**Active Members**
System costs are affected by the age, years of service and salary of active members. In this year's valuation, there are 801 active members with an average age of 38.6, average years of service of 13.4 years and average salary of $52,059. The 752 active members in the prior valuation had an average age of 39.1, average service of 14.1 years and average salary of $47,935.

**Inactive Members**
In addition, there were five members entitled to a return of their employee contributions, totaling $147,695. Last year, there were five members who were entitled to receive a return of their employee contributions, totaling $80,742.

*These graphs show a distribution of active members by age and by years of service.*

**CHART 2**

**Distribution of Active Members by Age as of April 30, 2002**

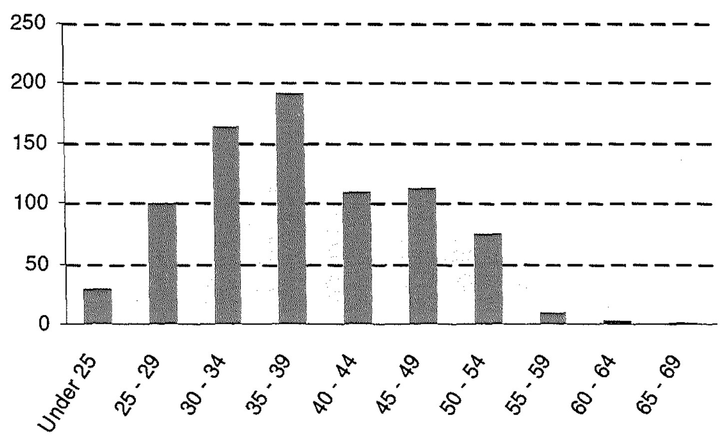
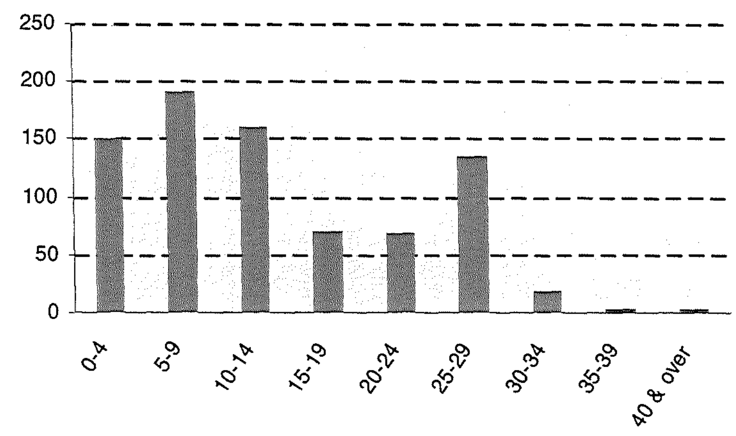



**CHART 3**

**Distribution of Active Members by Years of Service as of April 30, 2002**



**Pensioners and Beneficiaries**

As of April 30, 2002, 610 pensioners and 209 beneficiaries were receiving total monthly benefits of $1,466,605. For comparison, in the previous valuation, there were 604 pensioners and 204 beneficiaries receiving monthly benefits of $1,358,304.

*These graphs show a distribution of the current pensioners and beneficiaries (widows and children) based on their monthly amount and age, by type of pension.*

**CHART 4**

**Distribution of Pensioners and Beneficiaries by Type and by Monthly Amount as of April 30, 2002**

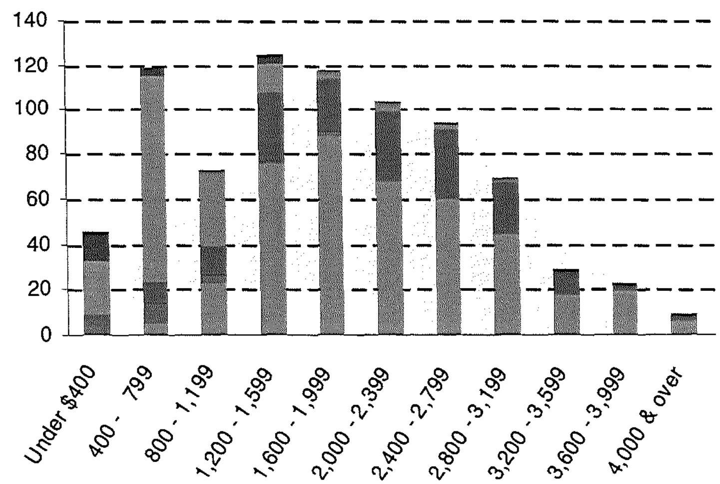
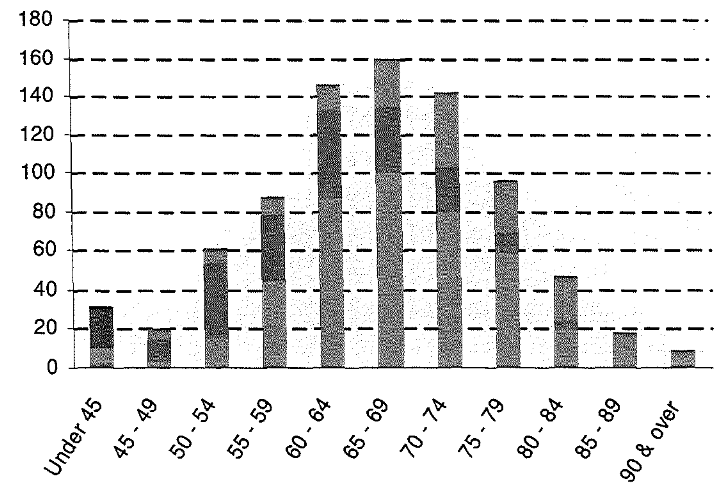



**CHART 5**

**Distribution of Pensioners and Beneficiaries by Type and by Age as of April 30, 2002**




- Children
- Widows
- Disability
- Vested
- Service

## B. FINANCIAL INFORMATION

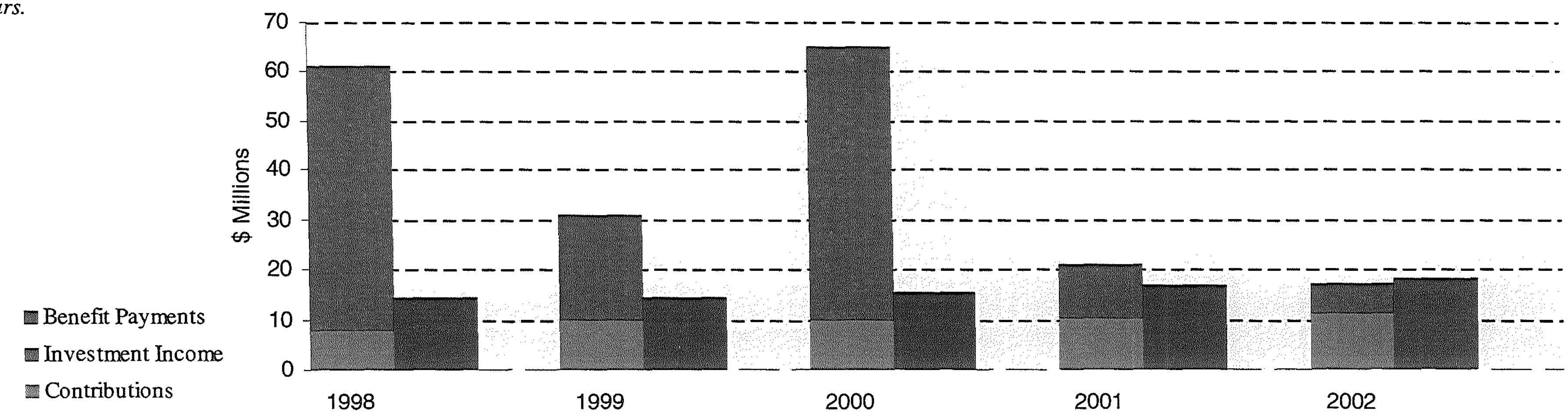
Retirement plan funding anticipates that, over the long term, both net contributions and net investment earnings (less investment fees and administrative expenses) will be needed to cover benefit payments.

Retirement plan assets change as a result of the net impact of these income and expense components. Additional financial information, including a summary of these transactions for the valuation year, is presented in Section 3, Exhibits D, E and F.

*The chart depicts the components of changes in the actuarial value of assets over the last five years.*

**CHART 6**

**Net Contributions and Investment Income on an Actuarial Basis Compared to Benefits Paid: 1998 – 2002**



It is desirable to have level and predictable System costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the System costs are more stable.

The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

*The chart shows the determination of the actuarial value of assets as of the valuation date.*

**CHART 7**

**Determination of Actuarial Value of Assets for Year Ended April 30, 2002**

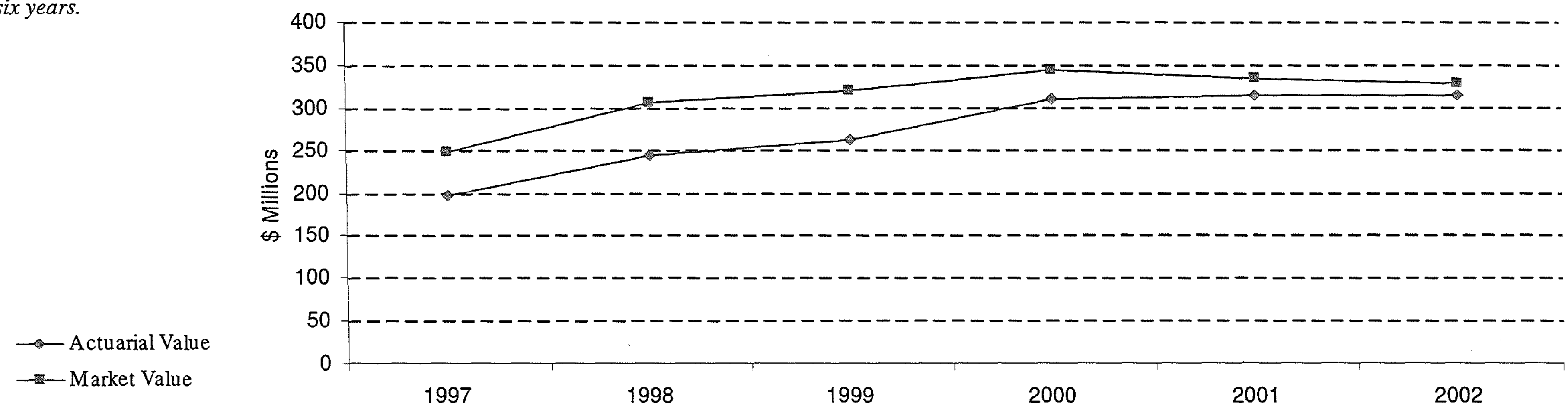
| | |
|---|---|
| 1. Actuarial value of assets to be written up | $314,419,934 |
| 2. Contributions, interest and dividends, less benefit payments and expenses | -4,509,869 |
| 3. Preliminary actuarial value of assets: (1) + (2) | 309,910,065 |
| 4. Market value of assets to be written up | 328,458,377 |
| 5. Adjustment toward market value: 20% of [(4) - (3)] | 3,709,662 |
| 6. Adjustment to be within 10% corridor | 0 |
| 7. Final actuarial value of assets: (3) + (5) + (6) | $313,619,727 |
| 8. Actuarial value as a percentage of market value: (7) ÷ (4) | 95.5% |

Both the actuarial value and market value of assets are representations of the Pension System's financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because the Pension System's liabilities are compared to its assets to determine what portion, if any, remains unfunded. Amortization of the unfunded liability is an important element in determining the contribution requirement.

*This chart shows the change in the actuarial value of assets versus the market value over the past six years.*

**CHART 8**

**Actuarial Value of Assets vs. Market Value of Assets: 1997 – 2002**



## C. ACTUARIAL EXPERIENCE

To calculate the required contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the contribution requirement will decrease from the previous year. On the other hand, the contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The total gain/(loss) is ($26,652,129), ($18,971,217) from investments and ($7,680,912) from all other sources. The net experience variation from individual sources other than investments was 2.1% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

*This chart provides a summary of the actuarial experience during the past year.*

**CHART 9**

**Actuarial Experience for Year Ended April 30, 2002**

| | | |
|---|---|---|
| 1. | Net gain/(loss) from investments* | -$18,971,217 |
| 2. | Net gain/(loss) from other experience** | -7,680,912 |
| 3. | Net experience gain/(loss): (1) + (2) | -$26,652,129 |

** Details in Chart 10.*
*** Details in Chart 13.*

**Investment Rate of Return**

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Pension System's investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets is 8.00%. The actual rate of return for the 2002 plan year was 1.90%.

Since the actual return for the year was less than the assumed return, the Pension System's experienced an actuarial loss during the year ended April 30, 2002 with regard to its investments.

*This chart shows the gain/(loss) due to investment experience.*

**CHART 10**

**Investment Experience for Year Ended April 30, 2002**

| | |
|---|---|
| 1. Actual return | $5,913,817 |
| 2. Average value of assets | 311,062,922 |
| 3. Assumed rate of return | 8.00% |
| 4. Expected return: (2) x (3) | 24,885,034 |
| 5. Actual rate of return: (1) ÷ (2) | 1.90% |
| 6. Actuarial gain/(loss): (1) – (4) | -$18,971,217 |

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the market value investment return for the last five years, including five-year averages.

Based upon this experience and future expectations, we have maintained the assumed rate of return of 8.00%.

**CHART 11**

**Investment Return – Actuarial Value vs. Market Value: April 30, 1998 - 2002**

| | Net Interest and Dividend Income | | Adjustment Toward Market | | Change in Asset Method | | Actuarial Value Investment Return | | Market Value Investment Return | |
|---|---|---|---|---|---|---|---|---|---|---|
| Years Ended April 30 | Amount | Percent | Amount | Percent | Amount | Percent | Amount | Percent | Amount | Percent |
| 1998 | $9,578,995 | 4.94 | $43,630,769 | 22.51 | - - | - - | $53,209,764 | 26.48 | $64,857,213 | 25.90 |
| 1999 | 6,336,592 | 2.62 | 14,901,188 | 6.17 | - - | - - | 21,237,780 | 8.70 | 19,902,793 | 6.52 |
| 2000 | 6,884,245 | 2.67 | 48,186,422 | 18.70 | - - | - - | 55,070,667 | 21.13 | 29,911,717 | 9.34 |
| 2001 | 6,236,109 | 2.03 | 4,637,434 | 1.51 | - - | - - | 10,873,543 | 3.54 | -5,022,522 | -1.47 |
| 2002 | 2,204,155 | 0.71 | 3,709,662 | 1.19 | - - | - - | 5,913,817 | 1.90 | 2,202,729 | 0.67 |
| Total | $31,240,096 | | $115,065,475 | | - - | | $146,305,571 | | $111,851,930 | |
| | | | | | | | Five-year average return | 11.18 | | 7.23 |

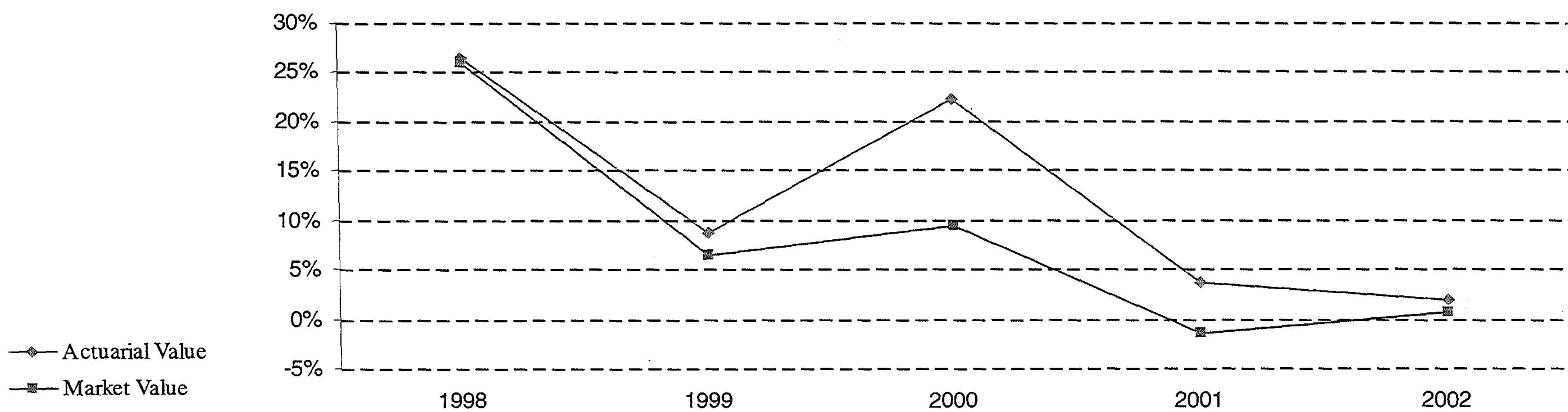
*Note: Each year's yield is weighted by the average asset value in that year.*

Subsection B described the actuarial asset valuation method that gradually takes into account fluctuations in the market value rate of return. The effect of this is to stabilize the actuarial rate of return, which contributes to leveling pension plan costs.

*This chart illustrates how this leveling effect has actually worked over the years 1998 - 2002 .*

**CHART 12**

**Market and Actuarial Rates of Return: 1998 - 2002**



## Other Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among the participants,
- retirement experience (earlier or later than expected),
- mortality (more or fewer deaths than expected),
- the number of disability retirements,
- the number of new members, and
- salary increases different than assumed.

The net loss from this other experience for the year ended April 30, 2002 amounted to $7,680,912 which is 2.1% of the actuarial accrued liability.

A brief summary of the gain/(loss) experience of the Pension System for the year ended April 30, 2002 is shown in the chart below.

*The chart shows the elements of the experience gain/(loss) for the most recent year.*

### CHART 13
### Experience for Year Ended April 30, 2002

| | |
|---|---|
| 1. Turnover | -$537,574 |
| 2. Retirement | 456,716 |
| 3. Deaths among pensioners & beneficiaries | -1,512,992 |
| 4. Salary increases for continuing actives | -4,681,971 |
| 5. Pre-retirement mortality | -59,748 |
| 6. Disability | 626,204 |
| 7. New Members | -374,192 |
| 8. Data adjustments | -758,094 |
| 9. Show-up beneficiaries | -600,944 |
| 10. Miscellaneous | -238,317 |
| 11. Total | -$7,680,912 |

## D. RECOMMENDED CONTRIBUTION

The amount of the annual contribution is established as 19.6% of payroll. The calculated normal cost is 12.96% of payroll. The amount available for amortization is 6.64% of payroll, which will be able to pay off the unfunded actuarial accrued liability under 33 years.

The contribution rates as of May 1, 2002 are based on all of the data described in the previous sections, the actuarial assumptions described in Section 4, and the System's plan provisions adopted at the time of preparation of the Actuarial Valuation. They include all changes affecting future costs, adopted benefit changes, actuarial gains and losses and changes in the actuarial assumptions.

*The chart shows the determination of the recommended contribution.*

**CHART 14**

**Recommended Contribution**

| | Year Beginning May 1 | | | |
|---|---|---|---|---|
| | 2002 | | 2001 | |
| | Amount | % of Payroll | Total | Total % of Payroll |
| 1. Total normal cost, adjusted for timing* | $9,384,449 | 22.51% | $8,108,079 | 22.49% |
| 2. Expected employee contributions, adjusted for timing* | -3,982,246 | -9.55% | -3,442,484 | -9.55% |
| 3. City normal cost: (1) + (2) | 5,402,203 | 12.96% | 4,665,595 | 12.94% |
| 4. Actuarial accrued liability | 358,688,291 | | 334,755,464 | |
| 5. Actuarial value of assets | 313,619,727 | | 314,419,934 | |
| 6. Unfunded/(overfunded) actuarial accrued liability: (4) – (5) | $45,068,564 | | $20,335,530 | |
| 7. Amount available for amortization | 2,770,783 | 6.64% | 2,399,608 | 6.66% |
| 8. Total recommended City contribution: (3) + (7), adjusted for timing* | 8,172,986 | 19.60% | 7,065,203 | 19.60% |
| 9. Total anticipated 2002 payroll | $41,698,908 | | $36,046,956 | |
| 10. Effective amortization period | 33 years | | 11 years | |

**Recommended contributions are assumed to be paid at the end of every month.*

## Reconciliation of Recommended Contribution

The chart below details the changes in the recommended City contribution from the prior valuation to the current year's valuation.

*The chart reconciles the contribution from the prior valuation to the amount determined in this valuation.*

**CHART 15**

**Reconciliation of Recommended Contribution from May 1, 2001 to May 1, 2002**

| | |
|---|---|
| **Recommended Contribution as of May 1, 2001** | $7,065,203 |
| Effect of change in amortization period | -2,876,637 |
| Effect of contributions (more)/less than recommended contribution | -129,981 |
| Effect of investment (gain)/loss | 2,407,531 |
| Effect of other gains and losses on accrued liability | 970,258 |
| Effect of net other changes | 736,612 |
| **Total change** | 1,107,783 |
| **Recommended Contribution as of May 1, 2002** | $8,172,986 |

## E. INFORMATION REQUIRED BY GASB

Government Accounting Standards Board (GASB) reporting information provides standardized information for comparative purposes of governmental pension plans. This information allows a reader of the financial statements to compare the funding status of one governmental plan to another on relatively equal terms.

Critical information to GASB is the historical comparison of the GASB required contribution to the actual contributions. This comparison demonstrates whether a plan is being funded on an actuarially sound basis and in accordance with the GASB funding requirements. Chart 16 below presents a graphical representation of this information for the System, with adjustments for timing.

The other critical piece of information regarding the System's financial status is the funded ratio. This ratio compares the assets of the plan to the liabilities of the plan as calculated under GASB. High ratios indicate a well-funded plan with assets sufficient to pay most benefits. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other changes.

The details regarding the calculations of these values and other GASB numbers may be found in Section 4, Exhibits II, III, and IV.

*These graphs show key GASB factors.*

**CHART 16**

**Required Versus Actual Contributions**

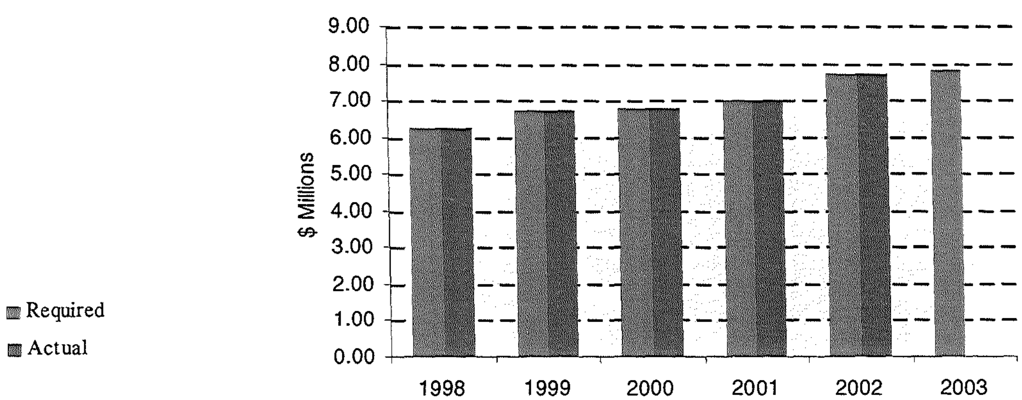
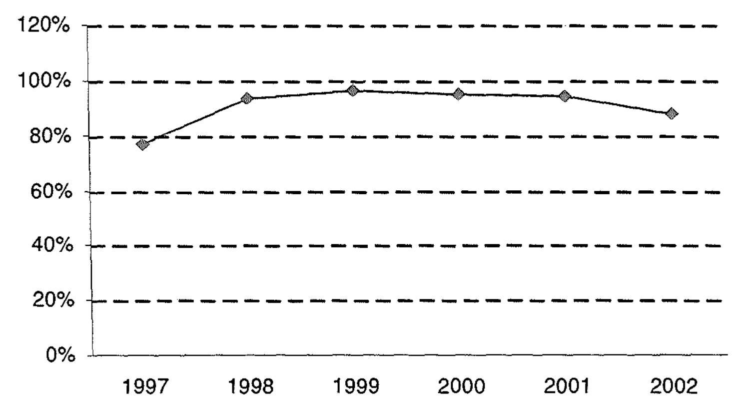



**CHART 17**

**Funded Ratio**



## EXHIBIT A
### Table of System Coverage

| Category | Year Ended April 30: 2002 | 2001 | Change From Prior Year |
|---|---|---|---|
| **Active members in valuation** | | | |
| Number | 801 | 752 | 6.5% |
| Average age | 38.6 | 39.0 | N/A |
| Average service | 13.4 | 14.1 | N/A |
| Total anticipated 2002 payroll | $41,698,908 | $36,046,956 | 15.7% |
| Average salary | 52,059 | 47,935 | 8.6% |
| Account balances | 41,255,635 | 39,043,202 | 5.7% |
| Eligible to retire on: | | | |
| Service pension | 119 | 63 | 88.9% |
| Deferred pension | 323 | 404 | -20.1% |
| Total active vested members | 442 | 467 | -5.4% |
| **Vested terminated members** | 0 | 0 | N/A |
| **Pensioners** | | | |
| Number in pay status | 610 | 604 | 1.0% |
| Average age | 65.4 | 65.2 | N/A |
| Average monthly benefit | $2,118 | $2,008 | 13.3% |
| **Beneficiaries in pay status*** | 209 | 204 | 2.5% |
| **Members due refunds** | 5 | 5 | 0.0% |
| **New disabilities** | 19 | 15 | 26.7% |
| Eligible to retire on service pension | 15 | 8 | 87.5% |

* *Widows and children.*

## EXHIBIT B

**Members in Active Service During Year Ended April 30, 2002**
**By Age, Years of Service, and Average Salary**

| | | Years of Service | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Age | Total | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40 & over |
| Under 25 | 29 | 29 | - - | - - | - - | - - | - - | - - | - - | - - |
| | $31,794 | $31,794 | - - | - - | - - | - - | - - | - - | - - | - - |
| 25 - 29 | 100 | 53 | 47 | - - | - - | - - | - - | - - | - - | - - |
| | 39,009 | 34,099 | $44,546 | - - | - - | - - | - - | - - | - - | - - |
| 30 - 34 | 165 | 49 | 83 | 33 | - - | - - | - - | - - | - - | - - |
| | 45,999 | 35,003 | 48,487 | $56,069 | - - | - - | - - | - - | - - | - - |
| 35 - 39 | 192 | 16 | 51 | 91 | 34 | - - | - - | - - | - - | - - |
| | 54,237 | 34,956 | 48,560 | 58,202 | $61,216 | - - | - - | - - | - - | - - |
| 40 - 44 | 111 | 3 | 7 | 36 | 29 | 26 | 10 | - - | - - | - - |
| | 58,309 | 40,184 | 44,109 | 58,012 | 61,459 | $60,175 | $60,774 | - - | - - | - - |
| 45 - 49 | 113 | - - | 2 | 1 | 5 | 35 | 70 | - - | - - | - - |
| | 59,060 | - - | 45,888 | 52,524 | 60,684 | 56,801 | 60,543 | - - | - - | - - |
| 50 - 54 | 76 | 1 | - - | - - | 1 | 7 | 55 | 12 | - - | - - |
| | 62,632 | 114,408 | - - | - - | 62,724 | 54,442 | 63,031 | $61,263 | - - | - - |
| 55 - 59 | 10 | - - | 1 | - - | 1 | - - | - - | 6 | 2 | - - |
| | 58,922 | - - | 46,020 | - - | 62,724 | - - | - - | 60,060 | $60,060 | - - |
| 60 - 64 | 3 | - - | - - | - - | - - | - - | - - | 1 | 1 | 1 |
| | 78,764 | - - | - - | - - | - - | - - | - - | 78,216 | 62,724 | $95,352 |
| 65 - 69 | 2 | - - | - - | - - | - - | - - | - - | - - | - - | 2 |
| | 70,470 | - - | - - | - - | - - | - - | - - | - - | - - | 70,470 |
| 70 & over | - - | - - | - - | - - | - - | - - | - - | - - | - - | - - |
| | - - | - - | - - | - - | - - | - - | - - | - - | - - | - - |
| Total | 801 | 151 | 191 | 161 | 70 | 68 | 135 | 19 | 3 | 3 |
| | $52,059 | $34,693 | $47,336 | $57,687 | $61,322 | $57,848 | $61,573 | $61,775 | $60,948 | $78,764 |

## EXHIBIT C

### Reconciliation of Member Data

| | Active Members | Child Beneficiaries | Pensioners | Widow Beneficiaries | Total |
|---|---|---|---|---|---|
| Number as of May 1, 2001 | 752 | 21 | 604 | 183 | 1,560 |
| New participants | 78 | 0 | N/A | N/A | 78 |
| Terminations – with vested rights | 0 | 0 | 0 | 0 | 0 |
| Terminations – without vested rights | -5 | 0 | N/A | N/A | -5 |
| Retirements | -5 | 0 | 5 | N/A | 0 |
| New disabilities | -19 | 0 | 19 | N/A | 0 |
| Return to work | 0 | 0 | 0 | N/A | 0 |
| Died with beneficiary | 0 | 0 | -7 | 7 | 0 |
| Died without beneficiary | 0 | 0 | -7 | -7 | -14 |
| Rehired | 0 | 0 | 0 | N/A | 0 |
| Certain period expired | N/A | 0 | -4 | 0 | -4 |
| Data adjustments | 0 | 0 | 0 | 0 | 0 |
| Show-up Beneficiaries | 0 | 1 | 0 | 4 | 5 |
| Number as of May 1, 2002 | 801 | 22 | 610 | 187 | 1,620 |

## EXHIBIT D
### Summary Statement of Income and Expenses

| | Year Ended April 30, 2002 | | Year Ended April 30, 2001 | |
|---|---|---|---|---|
| **Contribution income:** | | | | |
| City contributions | $7,709,082 | | $6,990,611 | |
| Employee contributions | 3,753,099 | | 3,405,594 | |
| Less administrative expenses | -37,178 | | -38,942 | |
| Net contribution income | | $11,425,003 | | $10,357,263 |
| **Investment income:** | | | | |
| Interest, dividends and other income | $3,819,552 | | $8,075,993 | |
| Adjustment toward market value | 3,709,662 | | 4,637,434 | |
| Less investment fees | -1,615,397 | | -1,839,884 | |
| Net investment income | | $5,913,817 | | $10,873,543 |
| **Total income available for benefits** | | $17,338,820 | | $21,230,806 |
| **Less benefit payments** | | -18,139,027 | | -16,823,097 |
| **Change in reserve for future benefits** | | -$800,207 | | $4,407,709 |

## EXHIBIT E
### Table of Financial Information

| | Year Ended April 30, 2002 | | Year Ended April 30, 2001 | |
|---|---|---|---|---|
| **Cash equivalents** | | $7,944,867 | | $10,654,322 |
| **Accounts receivable:** | | | | |
| Contributions | $870,372 | | $713,900 | |
| Investment Income | 11,844 | | 17,726 | |
| Sale of Investments | 1,625,323 | | 2,252,113 | |
| Total accounts receivable | | $2,507,539 | | $2,983,739 |
| **Investments** | | 320,919,514 | | 322,287,672 |
| **Total assets** | | $331,371,920 | | $335,925,733 |
| **Less accounts payable:** | | | | |
| Purchase of Investments | -$2,372,844 | | -$2,365,971 | |
| Administrative Expenses Payable | -540,699 | | -590,090 | |
| Total accounts payable | | -$2,913,543 | | -$2,956,061 |
| **Net assets at market value** | | $328,458,377 | | $332,969,672 |
| **Net assets at actuarial value** | | $313,619,727 | | $314,419,934 |

## EXHIBIT F

### Development of the Fund Through April 30, 2002

| Year Ended April 30 | City Contributions | Employee Contributions | Net Investment Return* | Administrative Expenses | Benefit Payments | Actuarial Value of Assets at End of Year |
|---|---|---|---|---|---|---|
| 1998 | $6,261,872 | $3,264,100 | $53,209,764 | $1,658,051 | $14,487,887 | $243,758,960 |
| 1999 | 6,732,893 | 3,122,134 | 21,237,780 | 36,761 | 14,335,928 | 260,479,078 |
| 2000 | 6,798,148 | 3,193,758 | 55,070,667 | 28,683 | 15,500,743 | 310,012,225 |
| 2001 | 6,990,611 | 3,405,594 | 10,873,543 | 38,942 | 16,823,097 | 314,419,934 |
| 2002 | 7,709,082 | 3,753,099 | 5,913,817 | 37,178 | 18,139,027 | 313,619,727 |

** Net of investment expenses.*

## EXHIBIT G

## Development of Unfunded Actuarial Accrued Liability for Year Ended April 30, 2002

| | | | |
|---|---|---|---|
| 1. | Unfunded Actuarial Accrued Liability at Beginning of Year | | $20,335,530 |
| 2. | Plus: Expected Changes Due to: | | |
| | Normal cost | $7,778,929 | |
| | Interest on unfunded and normal cost | 2,249,156 | |
| | Subtotal | $10,028,085 | |
| | Required City and Expected Employee Contributions | $10,507,687 | |
| | Interest on expected contributions | 444,612 | |
| | Subtotal | $10,952,299 | |
| | Scheduled change | | -$924,214 |
| 3. Plus: | Deficient (Surplus) Contributions: | | |
| | Required City and expected employee contributions | $10,507,687 | |
| | Actual City and employee contributions | -11,462,181 | |
| | Deficient (surplus) contributions | -954,494 | |
| | Interest on deficient (surplus contributions) | -40,387 | |
| | Deficient (surplus) contributions with interest | | -$994,881 |
| 4. Plus: | Actuarial (Gains)/Losses: | | |
| | Investment earnings | $18,971,217 | |
| | Salary increases | 4,681,971 | |
| | Disability | -626,204 | |
| | Turnover | 537,574 | |
| | Retirement | -456,716 | |
| | New members | 374,192 | |
| | Pre-retirement mortality | 59,748 | |
| | Post-retirement mortality | 1,512,992 | |
| | Data adjustments | 758,094 | |
| | Show-up beneficiaries | 600,944 | |
| | Miscellaneous | 238,317 | |
| | Total actuarial (gains)/losses | | $26,652,129 |
| 5. | Unfunded Actuarial Accrued Liability at End of Year | | $45,068,564 |

## EXHIBIT H
### Definitions of Pension Terms

The following list defines certain technical terms for the convenience of the reader:

**Assumptions or actuarial assumptions:** The estimates on which the cost of the System is calculated including:

(a) Investment return — the rate of investment yield which the System will earn over the long-term future;

(b) Mortality rates — the death rates of employees and pensioners; life expectancy is based on these rates;

(c) Retirement rates — the rate or probability of retirement at a given age;

(d) Turnover rates — the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement.

**Normal Cost:** The amount of contributions required to fund the benefit allocated to the current year of service.

**Actuarial Accrued Liability For Actives:** The equivalent of the accumulated normal costs allocated to the years before the valuation date.

**Actuarial Accrued Liability For Pensioners:** The single sum value of lifetime benefits to existing pensioners. This sum takes account of life expectancies appropriate to the ages of the pensioners and of the interest which the sum is expected to earn before it is entirely paid out in benefits.

**Unfunded Actuarial Accrued Liability:** The extent to which the actuarial accrued liability of the System exceeds the assets of the System. There is a wide range of approaches to paying off the unfunded actuarial accrued liability, from meeting the interest accrual only to amortizing it over a specific period of time.

| | |
|---|---|
| **Amortization of the Unfunded Actuarial Accrued Liability:** | Payments made over a period of years equal in value to the System's unfunded actuarial accrued liability. |
| **Investment Return:** | The rate of earnings of the System from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next. |

## EXHIBIT I

### Summary of Actuarial Valuation Results

The valuation was made with respect to the following data supplied to us.

| | | | |
|---|---|---|---|
| 1. | Pensioners as of the valuation date (including 209 beneficiaries in pay status) | | 819 |
| 2. | Members active during the year ended April 30, 2002 | | 801 |
| | Fully vested | 442 | |
| | Not vested | 359 | |
| 3. | Members due refunds as of April 30, 2002 | | 5 |

**EXHIBIT I (Continued)**

**Summary of Actuarial Valuation Results**

| | | |
|---|---|---|
| 1. Actuarial accrued liability: | | $358,688,291 |
| Pensioners and beneficiaries | 193,035,885 | |
| Active participants | 165,504,711 | |
| Due refund | 147,695 | |
| 2. Actuarial value of assets ($328,458,377 at market value) | | 313,619,727 |
| 3. Unfunded actuarial accrued liability | | 45,068,564 |
| 4. Portion of unfunded/(overfunded) actuarial accrued liability left to amortize | | 2,770,783 |
| 5. Normal cost, payable monthly: | | |
| Amount | | 9,384,449 |
| As a percent of payroll | | 22.51% |
| 6. Total recommended contribution: (4) + (5) | | |
| Amount | | 12,155,232 |
| As a percent of payroll | | 29.15% |
| 7. Expected employee contribution (9.55% of payroll) | | 3,982,246 |
| 8. Recommended City contribution: (6) – (7) | | |
| Amount | | 8,172,986 |
| As a percent of payroll | | 9.53% |
| 9. Expected City contribution (19.6% of payroll) | | 8,172,986 |
| 10. Total anticipated 2002 payroll | | $41,698,908 |
| 11. Effective amortization period | | 33 years |

**EXHIBIT II**

**Supplementary Information Required by the GASB – Schedule of City Contributions**

| Plan Year Ended April 30 | Annual Required Contributions | Actual Contributions | Percentage Contributed* |
|---|---|---|---|
| 1998 | $6,261,872 | $6,261,872 | 100.0% |
| 1999 | 6,732,893 | 6,732,893 | 100.0% |
| 2000 | 6,798,148 | 6,798,148 | 100.0% |
| 2001 | 6,990,611 | 6,990,611 | 100.0% |
| 2002 | 7,709,082 | 7,709,082 | 100.0% |
| 2003 | 8,172,986 | -- | -- |

** Maximum of 100% is shown.*

## EXHIBIT III

### Supplementary Information Required by the GASB – Schedule of Funding Progress

| Actuarial Valuation Date | Actuarial Value of Assets (a) | Actuarial Accrued Liability (AAL) (b) | Unfunded/ (Overfunded) AAL (UAAL) (b) - (a) | Funded Ratio (a) / (b) | Covered Payroll (c) | UAAL as a Percentage of Covered Payroll [(b) - (a) / (c)] |
|---|---|---|---|---|---|---|
| 05/01/1997 | $197,169,162 | $255,316,500 | $58,147,338 | 77.23% | $31,597,200 | 184.03% |
| 05/01/1998 | 243,758,960 | 261,215,900 | 17,456,940 | 93.32% | 31,535,100 | 55.36% |
| 05/01/1999 | 260,479,078 | 269,962,700 | 9,483,622 | 96.49% | 33,092,300 | 28.66% |
| 05/01/2000 | 310,012,225 | 326,277,600 | 16,265,375 | 95.01% | 33,712,200 | 48.25% |
| 05/01/2001 | 314,419,934 | 334,755,464 | 20,335,530 | 93.93% | 36,046,956 | 56.41% |
| 05/01/2002 | 313,619,727 | 358,688,291 | 45,068,564 | 87.44% | 41,698,908 | 108.08% |

## EXHIBIT IV

### Progress of Pension Rolls Through April 30, 2002

| | | | In Force at End of Year | |
|---|---|---|---|---|
| Year Ended April 30 | Awards | Deaths* | Number | Monthly Amount |
| 1997 | 36 | 31 | 764 | $999,800 |
| 1998 | 38 | 21 | 781 | 1,090,300 |
| 1999 | 32 | 31 | 782 | 1,122,400 |
| 2000 | 53 | 36 | 799 | 1,273,900 |
| 2001 | 28 | 19 | 808 | 1,358,300 |
| 2002 | 29 | 18 | 819 | 1,466,605 |

* *Includes certain period expired benefits.*

## EXHIBIT V

### Supplementary Information Required by the GASB

| | |
|---|---|
| Valuation Date | May 1, 2002 |
| Actuarial Cost Method | Entry Age Normal Cost Method |
| Amortization Method | Level percent of payroll; open |
| Remaining Amortization Period | 33 yrs. ~~Infinite~~ |
| Asset Valuation Method (Typo) | Asset values are gradually adjusted toward market value by adding to the "preliminary asset value" 20% of the difference between the market value and the preliminary asset value. The preliminary asset value is the actuarial asset value at the beginning of the year plus net new money. Net new money is the sum of contributions, dividends, and interest, less the sum of refunds, expenses and benefit payments. If the actuarial value of assets is less than 90% or more than 110% of the market value, an adjustment is made to the actuarial value to bring the value within this corridor. |
| Actuarial Assumptions: | |
| Investment Rate of Return* | 8.00%, net of investment and administrative expenses |
| Projected Salary Increases | 3.00% to 8.00% |
| Cost of Living Adjustments | 3.0% of original benefit |
| Membership of the Plan: | |
| Pensioners and Beneficiaries receiving benefits | 819 |
| Active plan members | 801 |
| Members due refunds | 5 |
| Total | 1,625 |

* *Includes inflation at 3.00%.*

**EXHIBIT VI**

**Actuarial Assumptions and Actuarial Cost Method**

**Mortality Rates:**

| | |
|---|---|
| *Healthy:* | 1971 Group Annuity Mortality Table with 5% of deaths assumed to be Duty related |
| *Disabled:* | 1983 Railroad Retirement Board Disabled Life Mortality Table |

**Termination Rates before Retirement:**

| | Rate (%) | | | |
|---|---|---|---|---|
| | Mortality | | Disability | Withdrawal |
| Age | Male | Female | | |
| 20 | 0.05 | 0.03 | 0.03 | 2.50 |
| 25 | 0.06 | 0.03 | 0.05 | 2.50 |
| 30 | 0.08 | 0.05 | 0.13 | 2.25 |
| 35 | 0.11 | 0.07 | 0.30 | 1.40 |
| 40 | 0.16 | 0.09 | 0.60 | 1.00 |
| 45 | 0.29 | 0.14 | 1.12 | 1.00 |
| 50 | 0.53 | 0.22 | 1.90 | 0.70 |
| 55 | 0.85 | 0.33 | 4.50 | - |
| 60 | 1.31 | 0.55 | 7.60 | - |

## Percentage of Disability Retirements that are Duty Related:

| Age | Annual Rate (%) |
|---|---|
| 20 - 24 | 75.0 |
| 25 - 29 | 66.7 |
| 30 - 34 | 70.6 |
| 35 - 39 | 78.9 |
| 40 - 44 | 81.1 |
| 45 - 49 | 81.9 |
| 50 - 54 | 80.3 |
| 55 - 59 | 78.2 |
| 60 and up | 75.4 |

## Retirement Rates for Active Employees:

| Years of Service | Rate(%) |
|---|---|
| 25 | 10 |
| 26 | 10 |
| 27 | 5 |
| 28 | 5 |
| 29 | 15 |
| 30 | 25 |
| 31 | 50 |
| 32 | 50 |
| 33 | 50 |
| 34 | 50 |
| 35 years, or age 65 if earlier | 100 |

**Retirement Age for Inactive Vested Members:** 50

**Unknown Data for Members:** Same as those exhibited by members with similar known characteristics.

**Percent Married:** 94% of active participants

**Age of Spouse:** Female (or male) spouses 4 years younger (or older) than their spouses.

**Eligible Children:** None

**Net Investment Return:** 8.00%, net of investment and administrative expenses, including inflation at 3.00%.

**Salary Increases:**

| Age | Rate (%) |
|---|---|
| Less than 25 | 8.00 |
| 25 - 29 | 7.50 |
| 30 - 34 | 7.00 |
| 35 - 39 | 6.50 |
| 40 - 44 | 5.50 |
| 45 - 49 | 5.00 |
| 50 - 54 | 4.50 |
| 55 - 59 | 4.50 |
| 60 - 64 | 4.00 |
| 65 and up | 3.00 |

**Actuarial Value of Assets:** Asset values are gradually adjusted toward market value by adding to the "preliminary asset value" 20% of the difference between the market value and the preliminary asset value. The preliminary asset value is the actuarial asset value at the beginning of the year plus net new money. Net new money is the sum of contributions, dividends, and interest, less the sum of refunds, expenses and benefit payments. If the actuarial value of assets is less than 90% or more than 110% of the market value, an adjustment is made to the actuarial value to bring the value within this corridor.

| | |
|---|---|
| **Actuarial Cost Method:** | Entry Age Normal Actuarial Cost Method. Entry Age is the age at the time the participant would have commenced employment if the plan had always been in existence. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by service, with Normal Cost determined as if the current benefit accrual rate had always been in effect. |
| **Amortization of Unfunded Actuarial Accrued Liability/(Surplus):** | Open amortization period; level percentage of payroll, recognizing monthly payments. Payroll is expected to increase 3.0% per year. |
| **Changes in Actuarial Assumptions and Methods since the preceding valuation:** | There have been no changes in actuarial assumptions or methods since the preceding actuarial valuation. |

## EXHIBIT VII

### Summary of System's Plan Provisions

This exhibit summarizes the major provisions of the Pension System included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

| | |
|---|---|
| **Plan Year:** | May 1 through April 30 |
| **Membership:** | All Firefighters shall become members as a condition of employment. Membership begins on the first day of employment. |
| **Creditable Service:** | Total creditable service is defined as the sum of the service as a Firefighter after becoming a member after July 1, 1953, plus any service earned prior to July 1, 1953, if continuous. |
| **Normal Retirement:** | |
| *Age Requirement* | None, however, members are required to retire after reaching age 65 regardless of service. |
| *Service Requirement* | 25 years of service. |
| *Amount* | The base pension is 2.5% of average final compensation per year of service to a maximum of 80%. Average final compensation is defined as the average of the two highest years of base compensation in the last ten years. The minimum retirement benefit is $600 per month. |
| **Duty Disability:** | |
| *Age Requirement* | None |
| *Service Requirement* | None |
| *Amount* | The pension is 62.5% of average final compensation at disability with a minimum 62.5% of the current maximum salary payable to the rank of a firefighter. The current maximum monthly salary as of May 1, 2002 is $4,377. The minimum disability benefit is $600 per month. |

| | |
|---|---|
| **Non-duty Disability:** | |
| *Age Requirement* | Less than 65 |
| *Service Requirement* | 10 years of service. |
| *Amount* | The pension is 25% of the average final compensation per month plus 2.5% per year of average final compensation per month for the number of years and months of creditable service in excess of 10 years, not to exceed 80% of the member's average final compensation. |
| **Vesting:** | |
| *Age Requirement* | None |
| *Service Requirement* | 10 years of service. |
| *Amount* | 2.5% of average final compensation per year of service to a maximum of 62.5%, payable at age 50.<br><br>If employee dies in a deferred status, before age 50, his beneficiary receives a lump sum equal to his contributions with interest. If such death occurs after age 50, his widow and children receive the same benefits as the pre-retirement non-duty, but reduced by the ratio of the member's service to 25. |
| **Withdrawal (Refund) Benefit:** | |
| *Age Requirement* | None |
| *Service Requirement* | Less than 10 years. |
| *Amount* | If an employee terminates before becoming eligible for a deferred pension, he receives a return of his contributions with interest. This benefit is reduced by a service charge of 10%, 8%, 6%, 4% or 2% if employee withdraws with less than one year, two years, three years, four years, or five years of service respectively. |

**Pre-Retirement Duty Death Benefit:**

| | |
|---|---|
| *Age Requirement* | None |
| *Service Requirement* | None |
| *Funeral Benefit* | A lump-sum payment of $2,000 is paid to help cover funeral costs. |
| *Surviving Spouse Benefit* | 100% of the accrued pension is paid with a minimum of 62.5% of the average final compensation. The surviving spouse's benefit for spouses of active firefighters eligible for a service pension is 100% of the regular pension reduced for the election of optional 100% joint and survivor coverage. The minimum benefit is $275 per month. |
| *Child's Benefit* | If there is no surviving spouse or the spouse dies or remarries, the spouse's benefit is divided equally to the children and paid until age 18 (or age 21 if a student). If a surviving spouse exists, $100 per month until age 18 (or age 21 if a student). |
| *Return of Contributions* | A return of accumulated contributions is guaranteed. If there is no surviving spouse or dependent children or if the surviving spouse dies, the accumulated contributions or the unpaid balance thereof shall be paid to the estate or to a named beneficiary. |

| | |
|---|---|
| **Pre-Retirement Non-duty Death Benefit:** | |
| *Age Requirement* | None |
| *Service Requirement* | None |
| *Funeral Benefit* | A lump-sum payment of $2,000 is paid to help cover funeral costs. |
| *Surviving Spouse's Benefit* | 50% of the accrued pension is paid, with a minimum of 25% of average final compensation payable until death. The surviving spouse's benefit for spouses of active firefighters eligible for a service pension is 100% of the regular pension reduced for the election of optional 100% joint and survivor coverage. The minimum benefit is $275 per month. |
| *Child's Benefit* | If no surviving spouse or the spouse dies, the spouse's benefit is divided equally to the children and paid until age 18 (or 21 if student). If a surviving spouse exists, $100 per month until age 18 (or 21 if student). |
| *Return of Contributions* | A return of accumulated contributions is guaranteed. If there is no surviving spouse or dependent children or if the surviving spouse dies or is no longer eligible to receive payments because of remarriage, the accumulated contributions or the unpaid balance thereof shall be paid to the estate or to a named beneficiary. |
| **Post-Retirement Death Benefit(s):** | |
| *Age Requirement* | None |
| *Service Requirement* | None |
| *Amount* | If married, pension benefits are paid in the form of a Joint and 50% Survivor annuity or in any other available optional form elected by the member and spouse in an actuarially equivalent amount. The minimum benefit is $275. If not married, benefits are payable for the life of the employee. Payments equal to the amount of the member's accumulated contributions are guaranteed. In addition, a lump-sum payment of $2,000 is paid to help cover funeral costs. |
| **Cost of Living Adjustment (COLA):** | A maximum increase of 3% of the original pension will be made annually. This does not apply to funeral benefits. Members must retire on or before January 1st in order to receive a COLA in the next year. |

| | |
|---|---|
| **Contributions:** | |
| *Pension System* | Employees contribute 9.55% of base salary. The City currently contributes 19.6% of payroll. |
| *Interest on Employee Contributions* | 3.0% per year. |
| *Health Insurance Subsidy* | Effective January 1, 2000, the City contribution is 2% of base salary and the member contribution is 1% of base salary. |
| | Contributions and benefits for the Health Insurance Subsidy are separately accounted for under the plan. The assets, liabilities, contributions, and benefits of the Health Insurance Subsidy are excluded from this valuation. |
| **Changes in System's Plan Provisions Since the Preceding Actuarial Valuation:** | There have been no changes in the System's plan provisions since the preceding actuarial valuation. |