

SECTION I

EXECUTIVE SUMMARY

INTRODUCTION

This report presents the results of the June 30, 2002 actuarial valuation of the Iowa Public Employees' Retirement System (IPERS). The primary purposes of performing the valuation are as follows:

- to evaluate the sufficiency of the statutory contribution rate structure to fund the benefits expected to be paid to members in the future and to determine if the Plan's funding meets the criteria set out in the funding policy established by IPERS,
- to evaluate the funded status of the System and disclose various asset and liability measures as of June 30, 2002, and
- to analyze and report on trends in System contributions, assets, and liabilities over the past several years.

The benefit provisions and actuarial methods reflected in this report are unchanged from last year's report, with one exception. This report reflects the movement of members working as "Conservation Officers" from the general membership to Special Services Group 2, effective July 1, 2002. The assumptions used in this valuation have changed from those used last year. Based on the results of the 1998-2001 Experience Study and our recommendations, the Investment Board adopted a new set of actuarial assumptions in September, 2002. The more significant changes in the actuarial assumptions are listed below:

- Change to the RP-2000 Mortality Table, with age adjustments as appropriate.
- Decrease in the assumed interest rate credited on contribution balances from 5.50% to 4.25%.
- Change in the assumption that vested members will elect a refund from an age-based to a service-based assumption.

Other minor changes were made in the "ultimate" retirement rates and the termination of employment rates for general members. The following assumptions for Special Services members were also changed: retirement, termination of employment, mortality and election of refund by vested members.

The actuarial valuation results provide a "snapshot" view of the System's financial condition on June 30, 2002. The results reflect net unfavorable experience for the past plan year as demonstrated by an unfunded actuarial liability (UAL) that was higher than expected, after taking into account the increase due to the new actuarial assumptions. The UAL on June 30, 2002 is \$1.255 billion as compared to an expected UAL of \$588 million. The unfavorable experience was the net impact of an experience loss of \$409 million on the actuarial value of assets and \$258 million on System liabilities.

The System's normal cost rate (cost allocated to the current year of service worked by active members) this year is 9.03%, which represents an increase from the normal cost rate in the 2001 valuation of 8.93% largely due to the change in assumptions. With the normal cost rate at its current level, only a small part of the total contribution rate is available to fund the UAL.

The significant increase in the UAL, coupled with the increase in the normal cost rate (which effectively reduces the payment to the UAL), has created a situation where the amortization period is infinite (UAL cannot be amortized). This is analogous to a mortgage or loan where the payment is not large enough to pay the interest on the outstanding debt. Consequently, the amount of the debt increases each year. In such a situation, even if all actuarial assumptions are met in future years, the current statutory contribution rate of 9.45% will not be sufficient to provide all of the future benefits promised to current members.

In 1998, legislation was passed to create the Favorable Experience Dividend (FED) reserve. The law provides that a portion of the favorable actuarial experience, if any, in subsequent years may be transferred to the FED reserve. Legislation passed in 2000 capped the FED reserve at ten years of expected payouts at the maximum level. Based on the results of the June 30, 2002 valuation, favorable actuarial experience did not occur for the System and, therefore, there is no transfer to the FED reserve. The current FED reserve is projected to be sufficient to make the maximum potential payment of 3% times years retired for the next five years (including the January 2003 payment), plus a reduced payment in the sixth year, if all assumptions are met in future years. The FED calculations are based on pure market value of assets so investment experience is fully reflected in each valuation. This has the potential to change the remaining years of payment from year to year.

CONTRIBUTION RATE

The Iowa statutes provide that most IPERS members (general members who represent 96.5% of total active members) shall contribute 3.7% of pay and employers shall contribute 5.75%, for a total of 9.45%. The Special Service groups contribute at an actuarially determined rate that changes each year.

IPERS adopted its Funding Policy in 1996 (see Appendix D for a copy of the Funding Policy). The purpose of the Funding Policy is to provide a basis for the evaluation of the System's funded status and to provide a set of safeguards to help ensure the financial solvency of the System. The Funding Policy defines the term "fully funded" to mean the current actuarial value of assets plus the present value of future expected contributions is equal to or greater than the present value of future benefit payments. There is an additional requirement that the amortization period not exceed 30 years in order for the System to be "fully funded".

One of the purposes of the actuarial valuation is to determine whether the contribution rate for the general membership will be sufficient to fund the future benefits expected to be paid by the System within the guidelines established in IPERS' Funding Policy. The statutory contribution rate is first applied to fund the normal cost rate. The remaining contribution rate is used to amortize the unfunded actuarial liability (UAL) as a level percentage of payroll, which in turn determines the amortization period. As a result, the remaining amortization period varies with each actuarial valuation. Because the normal cost rate for the general membership (9.03%) is so close to the statutory contribution rate of 9.45%, the remaining 0.42% of payroll available for payment toward the UAL is very small. Based on the current UAL amount and amortization payment, the amortization period is infinite. In order for the System to be "fully funded" in the current valuation (the amortization period to be 30 years), the contribution rate for the current year would have increased 1.01% to 10.46% of payroll. However, this rate could only remain stable (level) if all actuarial assumptions, including a 7.5% rate of return on the actuarial value of assets, are met each year in the future, which is unlikely to occur.

When the current assets plus the present value of future expected contributions are not equal to the present value of future benefits for the current membership, the System is not in "actuarial balance". IPERS' Funding Policy provides a set of criteria to assist in deciding whether an increase in the

contribution rate should be considered. If either of the following occurs in at least three of any five consecutive years, the Funding Policy recommends a contribution increase be considered:

- (1) the normal cost rate is within 0.50% of the statutory contribution rate of 9.45% (which first occurred in the 2002 valuation).
- (2) the amortization period exceeds 29 years (which it did for both the 2001 and 2002 valuations).

Based on the Funding Policy alone, there would be no action taken to increase contribution rates as a result of the 2002 valuation. However, based upon a number of factors discussed in the following paragraphs, we recommend action be taken now.

Although the determination that the System is not in "actuarial balance" is based on the assumption that actual experience in the future will unfold exactly as predicted by the actuarial assumptions, it almost certainly will not. Experience gains/losses will occur from year to year, particularly with respect to investment return. Because IPERS utilizes an asset smoothing method, investment experience greater/less than the assumed rate of return of 7.5% is spread over a number of years. As a result, there is currently a difference between actuarial and market value of assets of \$1.2 billion, excluding the FED reserve. Given the amount of unrecognized or deferred actuarial investment loss (actual investment returns below the assumed rate of 7.5%) and the volatility of the current market, it is likely there will be actuarial losses on the investment return assumption over the next few years. As the deferred actuarial investment loss is recognized over the next few years, it will exacerbate the funding shortfall first manifested in this year's report.

Given the current normal cost rate, the unfunded actuarial liability, and the amount of the unrecognized actuarial investment loss, we believe some type of additional contributions will be necessary in the future. While it is in the System's best interest for additional contributions to be made sooner instead of later, we recognize the budget and planning considerations of raising contribution rates. There are at least four choices:

- Option 1: "Wait and See".* The System could wait a few years and see if future experience unfolds to offset the recent negative experience.
- Option 2: "Immediate Change in Contribution Rates".* This option would make an immediate one-time change in the current contribution rates, based solely on information in the current valuation.
- Option 3: "Temporary Increase".* This option would implement an immediate increase in contribution rates to infuse additional dollars into the System as soon as possible, while recognizing that additional changes to contribution rates, benefit plan design or both will likely be necessary.
- Option 4: "Further Study".* This option would study the long term funding of the System, including various results based on capital market assumptions, to determine what change in the contribution structure, if any, is necessary.

Given the extremely small difference between the normal cost rate and the statutory rate, coupled with the significant amount of deferred actuarial investment loss (\$1.2 billion), we do not believe Option 1 is the best choice. Time is not likely to resolve the long term funding issues.

The fact that the System is not in actuarial balance does not create an immediate funding concern for the System. System assets are sufficient to make future projected benefit payments for many years. The shortfall between assets and liabilities that is indicated by this year's valuation is a long term funding issue. Given the infrequent adjustment of contribution rates in the past, we believe the possibility of

increasing contribution rates is a serious matter and one of interest to many different parties. Based on this valuation report alone, there is insufficient information for us to recommend the precise, permanent revision to the current contribution structure. Therefore, even though it infuses additional contribution dollars into the System immediately, Option 2 is not our recommended approach.

However, it is in the System's best interest for additional contributions to be made sooner instead of later. Furthermore, the earlier additional contributions are made, the lower the cost will be. Option 3 would increase the System's funding immediately but recognize that further adjustments will be necessary.

As mentioned earlier there is inadequate information available at this time to recommend new fixed contribution rates. Given the long term nature of the issue, there is adequate time to study the situation thoroughly and make the best possible decision. Future investment experience will have a dramatic impact on the contribution needs of the System so various possibilities need to be modeled to determine the range of probable outcomes. If a change is to be made to the contribution rates, it is in everyone's best interest for the new contribution rate structure to be adequate so rates will not have to be adjusted again in the short term. Therefore, our recommendation would be to select Option 3 and Option 4 or Option 4 alone.

IPERS plans to complete an Asset/Liability Study during fiscal year 2003. We recommend the long term funding issue and the determination of a new contribution rate structure be studied as an extension of that project. This approach will provide more sophisticated modeling techniques, based on statistical analysis and capital market assumptions, which will assist in quantifying the shortfall of the current contribution rate under various scenarios. It will also reflect potential changes in the future demographics of the active membership and possible changes in benefit plan design, which are also important parts of the System's long term funding.

EXPERIENCE FOR LAST PLAN YEAR

Numerous factors contributed to the change in the Systems' assets, liabilities and remaining amortization period for the unfunded actuarial liability between June 30, 2001 and June 30, 2002. The components are examined in the following discussion.

ASSETS

As of June 30, 2002, the System had total assets of \$14.4 billion, when measured on a market value basis, **excluding the Favorable Experience Dividend (FED) reserve account**. This was a decrease of \$ 1.0 billion from the prior year. The components of this change are shown below:

	Market Value (\$M)
Net Assets, June 30, 2001	\$ 15,358
• Employer and Member Contributions	+ 469
• Benefit Payments and Refunds	- 686
• Administrative Expenses	- 8
• Expected Investment Income (Based on 7.5% assumption)	+ 1,144
• Actuarial Gain/(Loss) on Investment Return	- 1,889
Net Assets, June 30, 2002 Before FED Transfer	\$ 14,388
• FED Transfer Payable January 15, 2003	- 0
Net Assets, June 30, 2002 After FED Transfer	\$ 14,388

On a market value basis, the rate of return was - 4.9%. The market value of assets is not used directly in the calculation of the contribution rate and amortization period. The actuarial value of assets is equal to the expected asset value based on the assumed interest rate of 7.5% plus 25% of the difference between the actual market value and the expected asset value.

The change in the actuarial value of assets from June 30, 2001 to June 30, 2002 (which also excludes the FED reserve account) is shown below:

	Actuarial Value (\$M)
Actuarial Assets, June 30, 2001	\$ 15,112
• Employer and Member Contributions	+ 469
• Benefit Payments and Refunds	- 686
• Expected Investment Income* (Based on 7.5% assumption)	+ 1,127
• Investment Gain/(Loss)	- 409
Actuarial Assets, June 30, 2002 Before FED Transfer	\$ 15,613
• FED Transfer Payable January 15, 2003	- 0
Actuarial Assets, June 30, 2002 After FED Transfer	\$ 15,613

*net of expenses

The dollar-weighted rate of return, net of investment and administrative expenses, measured on the actuarial value of assets was 4.8%. Due to the use of an asset smoothing method, there is currently \$1.2 billion of deferred actuarial investment loss that has not been recognized in the valuation process. Absent investment returns significantly above the 7.5% assumption in the next few years, the deferred actuarial investment loss will gradually be reflected in the actuarial value of assets. As this occurs through the smoothing method, the valuation results will show an actuarial loss on investment experience, which will contribute toward an increase in the unfunded actuarial liability.

The following table shows our projection of the next five valuations based on all future experience following the actuarial assumptions and using generally accepted actuarial techniques. Based on this analysis, and market returns of 7.5% per year, the System's funded ratio declines to 86% by 2007.

(\$Millions)	2002	Projections of Future Valuation Results				
	<u>Valuation</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
Market Value	\$14,388	\$15,166	\$15,990	\$16,864	\$17,790	\$18,772
Actuarial Liability	16,866	17,809	18,811	19,874	21,002	22,201
Actuarial Value	<u>(15,613)</u>	<u>(16,153)</u>	<u>(16,787)</u>	<u>(17,506)</u>	<u>(18,308)</u>	<u>(19,189)</u>
UAL	\$ 1,253	\$ 1,656	\$ 2,024	\$ 2,368	\$ 2,694	\$ 3,012
Funded Ratio	92.6%	90.7%	89.2%	88.1%	87.2%	86.4%

In order for the funded status not to deteriorate, there will need to be significant investment gains to offset the currently unrecognized \$1.2 billion deferred actuarial investment loss (absent other changes). To illustrate, we estimate the following:

- A market return of approximately 17% in 2002-03 will bring the actuarial value of assets back to market value at that time or,
- Market returns of approximately 11% in 2002-03 and 2003-04 will bring the actuarial value of assets back to market value at that time.

Even if one of these events occurs, the amortization period will remain infinite.

A comparison of asset values on both the market and actuarial basis is shown below:

(\$Millions excluding FED Reserve)	June 30		
	2002	2001	2000
Market Value of Assets	14,388	15,358	16,474
Actuarial Value of Assets	15,613	15,112	14,145
Actuarial Value/Market Value	108.5%	98.4%	85.9%

LIABILITIES

The actuarial liability is that portion of the present value of future benefits that will not be paid by future normal costs. The difference between this liability and the actuarial value of assets at the same date is called the unfunded actuarial liability (UAL). The dollar amount of unfunded actuarial liability is reduced if the contributions to the System exceed the normal cost for the year plus interest on the previous UAL.

The unfunded actuarial liability by group is shown below:

(\$Millions)	General Membership	Special Services 1	Special Services 2	Total
Actuarial Liability	\$16,257	\$218	\$393	\$16,868
Actuarial Value of Assets	14,960	233	420	15,613
Unfunded Actuarial Liability	1,297	(15)	(27)	1,255

See Exhibits 6 and 7 in Section 2 of the report for the detailed development of the unfunded actuarial liability for the System.

Actuarial gains (losses) result from actual experience that is more (less) favorable than anticipated based on the actuarial assumptions. These "experience" (or actuarial) gains or losses are reflected in the UAL and are measured as the difference between the expected unfunded actuarial liability and the actual unfunded actuarial liability, taking into account any changes due to assumption or benefit provision changes. Overall, the System experienced a net actuarial loss of \$667 million (see page 25 for a detailed development).

The change in the unfunded actuarial liability between June 30, 2001 and 2002 is shown below (in millions):

Unfunded Actuarial Liability, June 30, 2001	\$ 441
• Expected change in UAL	+ 3
• Investment experience	+ 409
• Liability and other experience	+ 258
• Benefit enhancements	+ 3
• Change in actuarial assumptions	+ 141
Unfunded Actuarial Liability <u>before</u> FED transfer, June 30, 2002	\$ 1,255
• FED Transfer	+ 0
Unfunded Actuarial Liability <u>after</u> FED transfer, June 30, 2002	\$ 1,255

There are four different measurements of liabilities discussed in this section.

- **Actuarial Balance Sheet Liability** is the present value of all future benefits (PVFB) expected to be paid from the System to current members (retired, active and deferred vested). This liability is calculated based on both future payroll projections and service credits to retirement or other separation from service.
- **Actuarial Liability** is the portion of the present value of future benefits (actuarial balance sheet liability) that will not be paid by future normal costs. It is also defined as the portion of the actuarial balance sheet liability allocated to service before the valuation date by the actuarial cost method.
- **Projected Benefit Obligation (PBO)** was previously used for financial reporting purposes under GASB No. 5 (since superseded by GASB 25) and is provided here for comparative purposes only. It represents the present value of benefits based on future payroll projections but only reflecting service credits as of the valuation date. This measure of the funded status of the plan does not directly impact the contribution rate or amortization period. It is not uncommon for the PBO to exceed the actuarial value of assets, since the PBO reflects future assumed salary increases.
- **Present Value of Accrued Benefits (PVAB)** is used only for informational purposes. It does not directly impact the contribution rate or amortization period for the System. This liability represents the present value of benefits earned to date, based on service and salary as of the valuation date. The PVAB can be used as a measure of the funded status of the System since it more closely represents the amount required to pay all accrued benefits if the fund were to liquidate on the measurement date. In a well-funded System, the expectation would be that the assets would be equal to or exceed the PVAB.

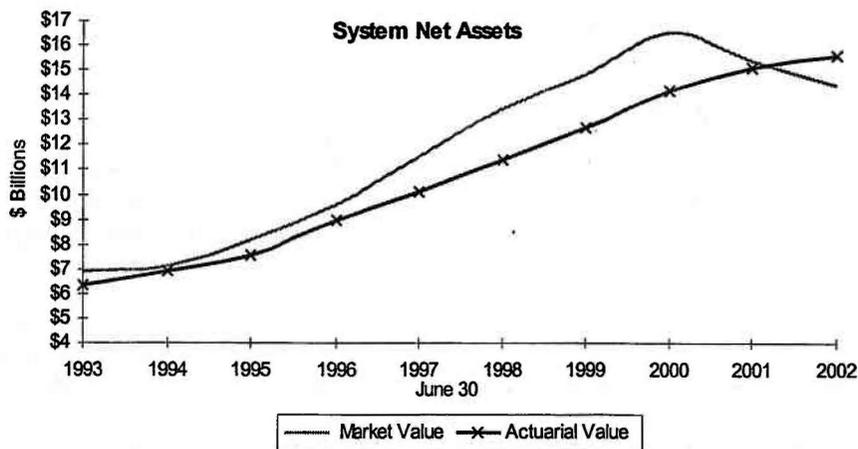
Each liability measurement discussed above is used for a different purpose. Therefore, the relative importance of the measurement will depend on the perspective of the person using the information. From an actuarial viewpoint, the actuarial balance sheet liability and the actuarial liability are the most critical because, along with the actuarial value of assets, they ultimately determine whether the statutory contribution rate for the System is sufficient to fund the current benefit structure, within the parameters set out in IPERS' funding policy. The other liability figures are valuable because they provide useful comparisons of assets and liabilities.

The System liabilities (in millions) as of June 30, 2002 and June 30, 2001 are summarized below:

	June 30	
	<u>2002</u>	<u>2001</u>
Actuarial Balance Sheet Liability (PVFB)	\$20,936	\$19,314
Actuarial Liability	16,868	15,553
PBO	15,345	14,157
Present Value of Accrued Benefits (PVAB)	13,155	12,233

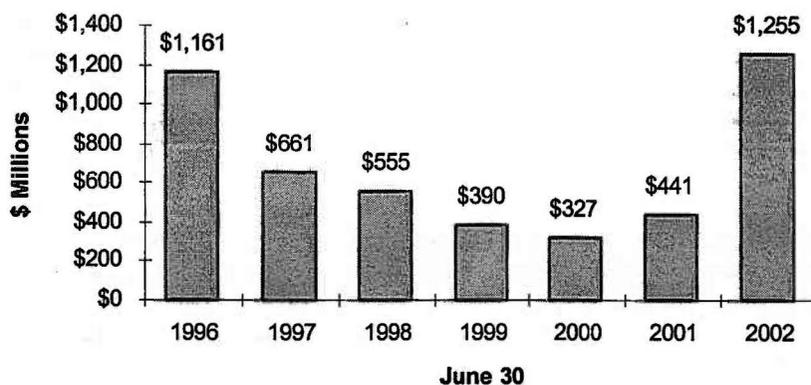
COMPARISON OF MAJOR VALUATION RESULTS

The major findings of the 2002 valuation compared with prior valuation results are summarized and compared on the following pages.



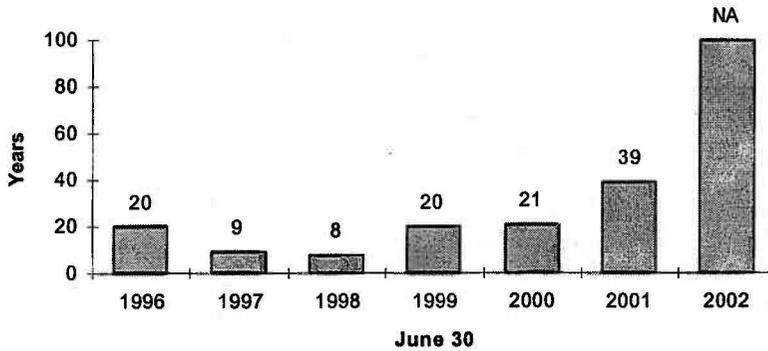
The market performance in the last two years has eliminated the surplus of market value over the actuarial value of assets. Currently the actuarial value exceeds the market value of assets by \$1.2 billion. Absent significant gains in the next few years, the deferred losses will flow through to the actuarial value of assets.

Unfunded Actuarial Liability



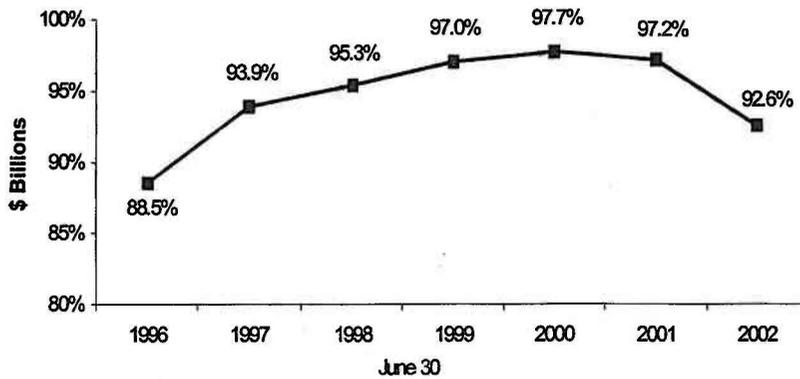
The unfunded actuarial liability reflects both asset and liability experience as well as changes due to benefit enhancements or changes in actuarial assumptions. The large increase in 2002 is the combined impact of an experience loss on assets and liabilities and an increase due to assumption changes.

Amortization Period



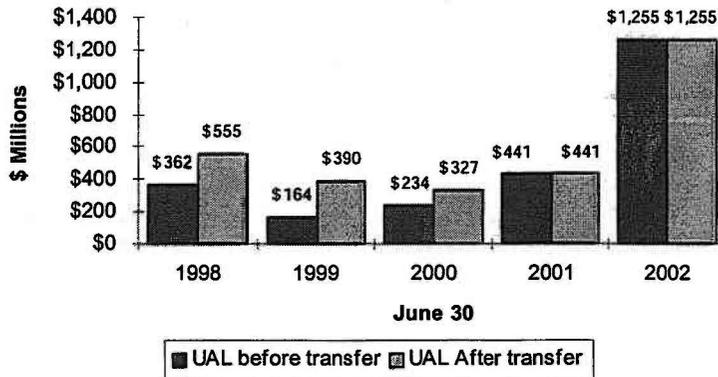
The amortization period reflects the size of the UAL as well as the increase in normal cost rate.

Funded Percentage



The funded ratio for IPERS increased, steadily from 1996 to 2000. Investment performance and liability increases combined to lower the funded ratio in 2002.

Impact of FED Transfer on Unfunded Actuarial Liability



The law provides for a portion of the favorable experience to be used to fund the FED Reserve. The amount transferred is dependent upon the funded status of IPERS. When such transfer occurs, there is an increase in the unfunded actuarial liability. No transfer has occurred in the last two years.

SUMMARY

IPERS, like most retirement plans in the United States (both public and private) is feeling the impact of nearly three years of record low market returns. This, coupled with negative demographic experience and a recent change in actuarial assumptions that increased liabilities, significantly increased the unfunded actuarial liability (UAL) of the System. For most members, IPERS is funded by a fixed (statutory) contribution rate of 9.45%. Given the small 0.42% difference between the 9.45% statutory rate and the 9.03% normal cost rate (cost allocated to the current year of service worked by active members), the increase in the unfunded actuarial liability this year resulted in an infinite amortization period. Despite the unfavorable experience on both the asset and liability side, the System remains nearly 93% funded. If the contribution rate were determined in this year's valuation with an amortization period of 30 years (which is the requirement in IPERS' Funding Policy for the System to be "fully funded"), the contribution rate would be 10.46% of payroll. However, this implicitly assumes all assumptions are met in the future, including a 7.5% rate of return on the actuarial value of assets.

The System faces challenges similar to other large retirement systems. Like most large Systems, IPERS uses an asset smoothing method. This methodology delays recognition of investment gains and losses on a fair (market) value basis. If there is a net deferred investment gain, the actuarial value of assets will be less than the fair value and the funded status will improve in the future if experience follows the assumptions. On the other hand, if there is a net deferred actuarial investment loss, the actuarial value of assets will be greater than the fair value, and the funded status will deteriorate over time if experience follows the assumptions. The current deferred actuarial investment loss for IPERS is \$1.2 billion. Absent market returns significantly in excess of 7.5% in the next few years, the deferred loss will flow into the actuarial value of assets and be recognized in the actuarial valuation process. They will be reflected as experience losses, with a resulting increase in the unfunded actuarial liability. Potentially the UAL could double over the next five years.

The small portion of the total contribution rate that is used to pay down the unfunded actuarial liability exacerbates the situation with the deferred actuarial investment loss. Currently, only 0.42% of payroll is available for payment toward the UAL. With the expectation that additional losses will flow through to the actuarial value of assets, causing the UAL in future years to increase, it appears nearly impossible for the System to be able to pay off the UAL over any reasonable time period without an increase in future contributions. Earlier in this report, we outlined our recommendation with respect to the current funded status and contribution rates. As the System's actuary, we recommend the long term funding of the System be studied, beginning with the Asset/Liability Study scheduled for fiscal year 2003. There is sufficient time to thoroughly analyze the contribution requirements of the System over the long term, taking into consideration the probabilities of different investment returns in the future, potential changes in the demographics of the active members, and possible benefit design changes. Any change in the benefit or contribution rate structure of IPERS is an extremely important decision and we believe all resources available should be used to provide the decision-makers with adequate information. Milliman USA intends to be an active participant in this process.

We conclude this executive summary by providing certain historical and comparative information for the System. The following page reflects recent historical impacts on IPERS' unfunded actuarial liability. The final page of this executive summary present comparative statistics and actuarial information on both the June 30, 2002 and June 30, 2001 valuations. All figures shown include the general membership and the two special service groups.

**SUMMARY OF HISTORICAL CHANGE
IN
IPERS UNFUNDED ACTUARIAL LIABILITY**

<u>(\$Millions)</u>	<u>1996-97</u>	<u>1997-98</u>	<u>1998-99</u>	<u>1999-2000</u>	<u>2000-01</u>	<u>2001-02</u>	<u>Total</u>
Unfunded Actuarial Liability (BOY¹)	1,161	661	555	390	327	441	N/A
• Expected Change	(1)	(43)	(37)	(32)	(22)	3	(132)
• Investment Experience	(474)	(716)	(730)	(781)	(81)	409	(2,373)
• Liability and Other Experience	(25)	118	(211)	515	217	258	872
• Benefit Enhancements	0	342	0	142	0	3	487
• Change in Assumptions	0	0	587	0	0	141	728
• FED Transfer	0	193	226	93	0	0	512
Unfunded Actuarial Liability (EOY²)	661	555	390	327	441	1,255	N/A
Amortization Years	9	8	20	21	39	*	

*Infinite

1 = Beginning in Year

2 = End of Year

**IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
PRINCIPAL RESULTS**

	June 30, 2002*	June 30, 2001	% Chg
SYSTEM MEMBERSHIP			
1. Active Membership			
- Number of Members	158,467	154,610	2.5
- Projected Payroll for Fiscal Year	\$5,090M	\$4,691M	8.5
- Average Salary	\$32,119	\$30,341	5.9
2. Inactive Membership			
- Number Not in Pay Status	98,228	96,105	2.2
- Number of Retirees/Beneficiaries	71,715	68,703	4.4
- Average Annual Benefit	\$9,091	\$8,221	10.6
ASSETS AND LIABILITIES			
1. Net Assets (excluding FED reserve)			
- Market Value	\$14,388M	\$15,358M	-6.3
- Actuarial Value	15,613M	15,112M	3.3
2. Projected Liabilities			
- Retired Members	\$6,207M	\$5,448M	13.9
- Inactive Members	426M	407M	4.7
- Active Members	14,303M	13,459M	6.3
- Total Liability	20,936M	19,314M	8.4
3. Actuarial Liability	\$16,869M	\$15,553M	8.5
4. Unfunded Actuarial Liability	\$1,255M	\$441M	184.6
5. Funded Ratio (Actuarial Value Assets/Actuarial Liability)	92.56%	97.16%	-4.7
SYSTEM CONTRIBUTIONS			
Required Contribution Rate**	9.45%	9.45%	0.0
Years Required to Amortize Unfunded Actuarial Liability	Infinite	39 years	N/A

M = (\$)Millions

* These membership figures are based on June 30 data.

** Contribution for certain special groups (3.5% of the membership) are not fixed at 9.45% but are actuarially determined each year.