

# State of Minnesota

## Summary of 2003 Valuations



A MILLIMAN GLOBAL FIRM



**Milliman USA**  
*Consultants and Actuaries*

LCP & R JAN 07 2004



**Milliman USA**  
Consultants and Actuaries

15800 Bluemound Road, Suite 400  
Brookfield, WI 53005-6069  
Tel +1 262 784.2250  
Fax +1 262 784.7287  
www.milliman.com

January 6, 2004

Minnesota Legislative Commission  
on Pensions and Retirement  
55 State Office Building  
St. Paul, Minnesota 55155-1201

ATTENTION: Mr. Lawrence A. Martin

Commission Members:

We have completed all of the July 1, 2003 Actuarial Valuations pursuant to the terms of our Actuarial Services Contract. This report summarizes the results of these actuarial valuations, with particular emphasis on changes occurring since the prior year's actuarial valuations.

This report covers commentary on the 2003-2004 funding levels, as well as summaries of significant plan changes and actuarial assumptions used. As per our modified contract, the analysis of purchased service credits is not included this year.

Supplemental information in Appendix A of this year's report includes an updated discussion of the impact of the significant decline in market values that occurred from early 2001 to early 2003.

We, Thomas K. Custis and William V. Hogan, are actuaries for Milliman USA. We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.


We hope that you will find this summary report informative as a supplement to the more detailed reports for each of the funds.

Respectfully submitted,

Milliman USA

  
Thomas K. Custis, F.S.A.

Consulting Actuary

  
William V. Hogan, F.S.A.

Consulting Actuary

TKC/bh

---

# STATE OF MINNESOTA

## Summary of 2003 Actuarial Valuations

---

### TABLE OF CONTENTS

	<u>Page</u>
<b>I. 2003-2004 FUNDING LEVELS</b>	1
TABLE I-A: 2003-2004 Funding Levels	5
TABLE I-B: Pattern of Sufficiency (Deficiency): 2001-2003	6
TABLE I-C: Accrued Benefit Funding Ratios: 2001-2003	7
TABLE I-D: Summary of PERA Consolidation Accounts Prior to Merger	8
TABLE I-E: Analysis of Service Credit Purchases	9
<b>II. PLAN PROVISIONS</b>	10
<b>III. ACTUARIAL ASSUMPTIONS AND METHODS</b>	11
TABLE III-A: Actuarial Assumptions - Category 1	13
TABLE III-B: Actuarial Assumptions - Category 2	14
TABLE III-C: Actuarial Assumptions - Category 3	16

### **APPENDICES**

<i>Appendix A:</i>	Alternative Analysis of Funded Status
<i>Appendix B:</i>	Summary Charts of Liability Funding Ratios

---

## I. 2003-2004 FUNDING LEVELS *(Tables I-A, I-B, I-C and I-D)*

---

As the Commission Actuary, we have determined the actuarial funding requirements in accordance with the requirements of Section 356.215, Minnesota Statutes, for each of the Funds covered by those statutes. Each employer contributes to their respective Fund on the basis of statutory requirements set by statutes for the individual Fund.

In Table I-A, we provide a detailed comparison of the requirements under Section 356.215 and the statutory employer contribution. It is this comparison which allows an analysis of the Fund's ability to meet its long-term commitments. Table I-B provides a three-year history of the sufficiency determination. The pattern of these results gives a more complete picture of emerging concerns as to the adequacy of statutory requirements.

Another measure of funding adequacy is the ratio of plan assets to the present value of accrued benefits. These ratios are summarized for the last three valuations in Table I-C. Since this is more of a termination measure of adequacy, it is generally considered a less important measure for public plans than the sufficiency determination summarized in Tables I-A and I-B. Nonetheless, it does give a somewhat different and useful perspective when viewed in conjunction with other factors. If proper funding progress is made, these numbers should move toward a ratio of slightly over 100%.

Tables I-A, I-B, and I-C have been prepared based on the applicable Minnesota Statutes and the Actuarial Standards that have been adopted by the Legislative Commission. Due to the deterioration in the market value of assets experienced in the last three fiscal years, we have provided additional analysis of the funding implications of the economic downturn in Appendix A.

Below we comment by plan on our analysis of the actuarial valuations. This commentary is based on the official valuations which reflect the asset smoothing methodology adopted four years ago. The reader should be cautioned that the analysis prepared in Appendix A presents a significantly bleaker picture for most of the plans.

### PERA

1. The Public Employees plan experienced a modest decline in the deficiency measure primarily due to asset losses. This plan continues to show a substantial deficiency as statutory contribution rates are significantly lower than required contributions. Improvement in the deficiency measure may be difficult to achieve in the next few years in light of current unrecognized asset losses. Further corrective action by the legislature may be needed to deal with this deficit situation.
2. The Police and Fire plan shows a significant deficiency measure that is primarily due to changes in assumptions coupled with asset losses; moreover, statutory contributions are substantially below ongoing normal costs. Corrective action by the legislature may be needed to deal with this deficit situation.

3. The Police and Fire Consolidation Fund was terminated and merged into the PERA Police and Fire Fund effective July 1, 1999. Table 1-D1 on page 9 summarizes the funded status of each account remaining as of June 30, 2003.
4. The Local Government Correctional plan is a new plan that was first effective July 1, 1999. The modest sufficiency is due mainly to decreases in the Normal Cost rate as new employees enter the plan.

### **MSRS**

5. The increase in the deficiency measure in the State Employees plan is primarily due to asset losses. Improvement in the deficiency measure may be difficult to achieve in the next few years in light of current unrecognized asset losses. Since Statutory contributions are below ongoing Normal Costs, it may be prudent to consider increases in the contribution rates.
6. All funding ratios declined as did the sufficiency measure in the State Patrol plan. This plan remains well funded. Similar to PERA Police & Fire Plan, ongoing normal costs exceed statutory contributions, albeit to a lesser extent.
7. The Correctional Employees plan experienced significant deterioration in funding ratios and in the sufficiency measure due to unfavorable asset experience. New job classifications continue to be allowed to transfer into the Correctional plan (we saw a 0.4% increase in active membership in this plan). In most cases, the assets transferred in from MSRS General were not adequate to fully cover the actuarial accrued liability of these new participants. Improvement in the deficiency measure may be difficult to achieve in the next few years in light of current unrecognized asset losses. Since the statutory contribution rates are less than ongoing normal costs of the plan, increases in statutory contribution rates should be considered.
8. The Legislators plan is funded on a terminal funding basis. This funding basis means that the State (as employer) does not pre-fund for benefits earned while service is being performed. Rather, at the time of retirement of one of these participants, the State must fund that portion of the retirement benefit not covered by member contributions. This funding approach has several disadvantages:
  - a. It can lead to substantial fluctuations in year-to-year funding requirements;
  - b. Due to lack of investment income, it means ultimate State costs are higher; and
  - c. It defers funding obligations from one generation of taxpayers to the next.

The Elective State Officers plan is handled on a pay-as-you-go basis. This funding basis means there is no accumulated funding (other than Member contributions held by the State's general fund). Actual retirement benefits are paid from the general funds via direct disbursements to the retirees (or beneficiaries). There are no longer any active employees in this plan.

Due to these funding mechanisms and to budget constraints, no actuarial valuation was prepared for these funds as of July 1, 2003. Since both of these plans have been closed to new members, it is probably not prudent to consider pre-funding at this time.

9. We note mixed results in the funding ratios and in the sufficiency measure for the Judges plan. Continued funding at the current statutory rates has substantially diminished any ongoing concern relating to short-term cash shortages.

### TEACHERS

10. The Minnesota TRA fund continues to have a negative unfunded actuarial accrued liability. The modest decline in the sufficiency measure is due primarily to investment experience.
11. The Duluth Teachers plan showed a large decline in funding ratios and funding status. Unfavorable asset experience contributed to the decreases in the measures of funded status of the plan. This plan continues to show a slight sufficiency.
12. The St. Paul Teachers plan showed deterioration in funding ratios and funding status primarily due to unfavorable asset experience. The decline in the sufficiency measure is contingent, of course, on the current level of State supplemental contributions. We note that the statutory contributions exceed the ongoing Normal Costs. Consequently, the deficiency is the result of the plan's unfunded accrued liability. This plan will need to be monitored closely in the year ahead.
13. Significant asset losses in the Minneapolis Teachers plan led to further deterioration in all funding ratios and another substantial increase in the deficiency percentage. As of July 1, 2003, the fund is even more severely distressed; the annuitant liability significantly exceeds the actuarial value of assets. Absent significant State supplemental contributions, this plan would be even more substantially deficient. The deficiency percentage can be expected to grow for reasons discussed below; **legislative attention is urgently needed.**

### MERF

14. The Minneapolis Employees Retirement Fund had unfavorable asset experience in the 2002-2003 year which was compounded by liability losses. We note that a significant source of the liability losses continues to come from retirement earlier than anticipated by the current actuarial assumptions. As the active membership of this Plan shrinks, the impact of this source of liability loss is likely to become greater as a percentage of active payroll. The State's portion of the supplemental contribution remains below its statutory maximum, but at a higher level than last year. Meanwhile required contribution rates for contributing employers increased approximately 2% of pay.

### ANALYSIS OF PURCHASED SERVICE CREDITS

Provisions under Minnesota Statutes Chapter 390, Article 4, provide the methodology for determining the amounts required to purchase prior service credits under certain circumstances. Those provisions also require the Commission Actuary to provide an analysis by individual and by plan of the impact on the plan's funded status of the service credits actually purchased during the 12 months preceding the valuation. However, this requirement was suspended by the LCPR for the July 1, 2003 actuarial valuations. Accordingly, we intentionally omitted Table I-E.

Plans for which statutory contribution increases should be considered are St. Paul Teachers, MSRS General, MSRS Correctional, PERA, and PERA Police and Fire. Minneapolis Teachers needs immediate attention.

The Minneapolis Teachers funding problem is severe and compounded by several factors that ensure that their deficiency measurement will worsen even further in the years to come:

- Current statutory rates being less than required mean that the unfunded actuarial liability is expected to increase.
- Since the current amortization requirement is to a fixed date, this increased amount, funded over a shorter period, will create significantly higher amortization requirements.
- For the most part, the Supplemental Contributions of the 1993, 1996 and 1997 legislative packages are fixed amounts; these amounts will provide a decreasing percentage when expressed as a percent of payroll.
- The mechanics of the post-retirement increase calculation have a built-in bias to contribute a loss to the plan. When the investment return average exceeds 8.5%, retirees get full credit (or nearly full credit) for excess earnings even though the plan is only 57% funded. When the investment return average is less than 8.5%, the retirees get nothing in that year, but the deficiency from the 8.5% may never be recovered.

The combination of all of these factors creates a dim picture indeed for this fund. Without early and substantial corrective legislation, this fund may face the very real possibility of running out of assets. We urge the LCPR to explore corrective actions as soon as possible.

---

On a broader perspective, results of this year's valuations confirm that the future funded status of the major public employee retirement plans in the State of Minnesota will be driven primarily by future returns on fund assets. Issues to consider may include:

- What principles should be established for consideration of changes in statutory contribution rates?
- What are the statutory mechanisms for dealing with a previously "overfunded" plan which becomes underfunded due to future asset or liability experience?
- Are there other structural changes in benefits, determination of funding requirements, actuarial methods, or investment policy that the LCPR might consider to improve the long-term financial management of these programs?

---

As Commission Actuary, we stand ready to assist the Commission with these and other issues.

**TABLE 1-A: 2003-2004 FUNDING LEVELS (PERCENTAGES)**

Fund	Section 356.215 Requirements			Statutory Requirements			Sufficiency/ (Deficiency)	
	Normal Cost	Supple- mental Cost	Expense	Total	Employee	Employer		Total
Public Employees (Chapter 353)	8.61%	3.06%	0.22%	11.89%	5.11%	5.54%	10.65%	(1.24%)
Police and Fire (Chapter 353)	22.05%	(2.65%)	0.12%	19.52%	6.20%	9.30%	15.50%	(4.02%)
Local Correctional (Chapter 353E)	13.65%	0.34%	0.14%	14.13%	5.83%	8.75%	14.58%	0.45%
State Employees (Chapter 352)	9.03%	0.19%	0.21%	9.43%	4.00%	4.00%	8.00%	(1.43%)
State Patrol (Chapter 352B)	22.63%	(5.00%)	0.18%	17.81%	8.40%	12.60%	21.00%	3.19%
Correctional (Chapter 352)	15.04%	0.57%	0.22%	15.83%	5.69%	7.98%	13.67%	(2.16%)
Judges (Chapter 490)	16.91%	9.70%	0.12%	26.73%	7.92%	20.50%	28.42%	1.69%
Teachers (Chapter 354)	8.84%	(0.90%)	0.43%	8.37%	5.00%	5.00%	10.00%	1.63%
Duluth Teachers (Chapter 354A)	9.08%	1.31%	0.88%	11.27%	5.50%	5.79%	11.29%	0.02%
St. Paul Teachers (Chapter 354A)	10.09%	10.04%	0.23%	20.36%	5.87%	11.03%*	16.90%	(3.46%)
Minneapolis Teachers (Chapter 354A)	10.36%	21.30%	0.30%	31.96%	5.84%	16.65%*	22.49%	(9.47%)
Minneapolis Employees (Chapter 422A)	17.91%	32.05%	2.53%	52.49%	9.75%	42.75%*	52.50%	0.01%

\* Includes State contributions of 8.06% for Minneapolis Teachers, 2.20% for St. Paul Teachers, and 18.44% for Minneapolis Employees.

\*\* Amounts in thousands of dollars



**TABLE 1-B: PATTERN OF SUFFICIENCY/DEFICIENCY: 2001-2003**

Fund	Actuarial Requirements			Statutory Requirements			Sufficiency/(Deficiency)		
	2001	2002	2003	2001	2002	2003	2001	2002	2003
Public Employees	11.60%	11.23%	11.89%	10.32%	10.66%	10.65%	(1.28)%	(0.57)%	(1.24)%
Police and Fire	13.12%	13.08%	19.52%	15.50%	15.50%	15.50%	2.38%	2.42%	(4.02)%
Local Correctional	14.21%	14.09%	14.13%	14.58%	14.58%	14.58%	0.37%	0.49%	0.45%
State Employees	6.79%	8.34%	9.43%	8.00%	8.00%	8.00%	1.21%	(0.34)%	(1.43)%
State Patrol	14.00%	14.34%	17.81%	21.00%	21.00%	21.00%	7.00%	6.66%	3.19%
Correctional	13.81%	14.73%	15.83%	13.67%	13.67%	13.67%	(0.14)%	(1.06)%	(2.16)%
Judges	26.72%	26.82%	26.73%	28.50%	28.50%	28.42%	1.78%	1.68%	1.69%
Teachers	7.85%	7.57%	8.37%	10.00%	10.00%	10.00%	2.15%	2.43%	1.63%
Duluth Teachers	7.49%	9.85%	11.27%	12.20%	11.29%	11.29%	4.71%	1.44%	0.02%
St. Paul Teachers	15.81%	18.56%	20.36%	17.07%	17.06%	16.90%	1.26%	(1.50)%	(3.46)%
Minneapolis Teachers	25.45%	29.05%	31.96%	22.72%	22.53%	22.49%	(2.73)%	(6.52)%	(9.47)%
Minneapolis Employees	41.78%	46.64%	52.49%	41.77%	46.63%	52.50%	(0.01)%	(0.01)%	0.01%

\* Amount in thousands of dollars

**TABLE 1-C: ACCRUED BENEFIT FUNDING RATIOS: 2001-2003**

*(Dollars in Millions)*

Fund	Current Assets			P.V. of Accrued Benefit			A.B. Funding Ratio		
	2001	2002	2003	2001	2002	2003	2001	2002	2003
Public Employees	\$10,527	\$11,017	\$11,196	\$11,305	\$12,107	\$12,878	93.12%	91.00%	86.94%
Police and Fire	\$4,510	\$4,707	\$4,714	\$3,567	\$3,738	\$4,243	126.43%	125.94%	111.10%
Local Correctional	\$25	\$40	\$56	\$24	\$40	\$58	102.11%	101.05%	96.96%
State Employees	\$7,367	\$7,673	\$7,757	\$6,116	\$6,880	\$7,354	120.45%	111.52%	105.49%
State Patrol	\$573	\$591	\$592	\$476	\$497	\$524	120.32%	119.01%	112.91%
Correctional	\$431	\$457	\$471	\$363	\$409	\$446	118.80%	111.73%	105.62%
Judges	\$124	\$131	\$134	\$158	\$165	\$168	78.07%	79.85%	79.67%
Teachers	\$16,834	\$17,379	\$17,384	\$15,099	\$15,715	\$16,104	111.49%	110.59%	107.95%
Duluth Teachers	\$274	\$281	\$278	\$243	\$268	\$279	112.38%	104.59%	99.65%
St. Paul Teachers	\$869	\$900	\$899	\$1,010	\$1,090	\$1,138	86.08%	82.55%	79.00%
Minneapolis Teachers	\$1,062	\$1,028	\$957	\$1,556	\$1,610	\$1,623	68.23%	63.86%	58.97%
Minneapolis Employees	\$1,507	\$1,540	\$1,519	\$1,594	\$1,648	\$1,630	94.54%	93.44%	93.22%

**Table 1-D1: Summary of Accounts with Positive  
Amortizable Bases at June 30, 2003**

<b>Account</b>	<b>Net Amortizable Base at June 30, 2002</b>	<b>January 1, 2003 Amortization Payment</b>	<b>Net Amortizable Base at June 30, 2003</b>
Anoka Police	\$75,438	\$14,149	\$67,112
Columbia Heights Police	\$302,337	\$325,675	\$0
Crookston Fire	\$20,496	\$3,845	\$18,233
Crookston Police	\$169,006	\$31,699	\$150,353
Duluth Fire	\$16,012,355	\$3,003,285	\$14,245,083
Duluth Police	\$4,376,782	\$820,911	\$3,893,720
Faribault Fire	\$1,260,070	\$236,339	\$1,120,997
Faribault Police	\$149,182	\$27,980	\$132,718
Hibbing Fire	\$2,437,148	\$457,113	\$2,168,161
Hibbing Police	\$1,067,312	\$200,186	\$949,513
Mankato Fire	\$716,779	\$134,439	\$637,669
St. Cloud Fire	\$2,259,878	\$423,864	\$2,010,457
St. Paul Fire	\$218,424	\$40,967	\$194,317
South St. Paul Fire	\$1,195,372	\$224,204	\$1,063,440
South St. Paul Police	\$566,545	\$106,261	\$504,016
Winona Fire	\$2,290,600	\$429,626	\$2,037,788
Winona Police	\$1,457,996	\$273,462	\$1,297,079
<b>Total</b>	<b>\$34,575,720</b>	<b>\$6,754,005</b>	<b>\$30,490,656</b>

**TABLE 1-E: ANALYSIS OF SERVICE CREDIT PURCHASES MADE IN PERIOD  
ENDING JUNE 30, 2003**

The analysis of service credit purchases made in period ending June 30, 2003 has been intentionally omitted from the July 1, 2003 Actuarial Valuation Report.

---

## II. PLAN PROVISIONS

---

This section of our summary presents a brief summary of those changes made to the statutes since last year's report that had an impact on the actuarial funding of a plan. This section is not designed to provide a comprehensive summary of all changes that were made. For a more detailed description of the plan provisions, please refer to the individual report for each Fund.

For the July 1, 2003 Actuarial Valuation, we highlight the following:

*Public Employees (Chapter 353):* None.

*Police and Fire (Chapter 353):* None.

*Local Government Correctional Service (Chapter 353E):* None.

*State Employees (Chapter 352):* None.

*State Patrol (Chapter 352B):* None.

*Correctional Employees (Chapter 352):* None

*Legislators (Chapter 3A):* None

*Elective State Officers (Chapter 352C):* None

*Judges (Chapter 490):* None

*Teachers Retirement Association (Chapter 354):* None.

*Duluth Teachers (Chapter 354A):* None.

*St. Paul Teachers (Chapter 354A):* None.

*Minneapolis Teachers (Chapter 354A):* None.

*Minneapolis Employees (Chapter 422A):* None.

---

### III. ACTUARIAL ASSUMPTIONS AND METHODS

(Tables III-A, III-B and III-C)

---

In projecting costs to be incurred by a pension plan in future years, it is necessary to provide actuarial assumptions relating to the future events which trigger those costs. To provide for all **significant** events, a wide range of assumptions must be utilized. These assumptions may be classified into three different categories.

The *first category* involves the economic assumptions. These assumptions include assumed investment return, salary increases, social security increases and cost-of-living increases on plan benefits. These assumptions are characterized as economic because they generally tend to be affected by interrelated factors that also affect economic growth.

The *second category* relates to assumptions which affect the expected working lifetime (and retired lifetime) of a member. These assumptions include mortality rates, disability rates and rates of separation due to other causes. Within a particular group classification (such as teachers or policemen), year-to-year mortality and disability rates may be reasonably represented by standard published tables. Separation due to other causes may vary considerably and should be reviewed and monitored on an individual group basis. In particular, where a subsidized benefit exists (such as for early retirement), extra care must be provided with respect to the rate of separation which is assumed to occur (such as the rate of early retirement).

The *third category* relates to miscellaneous assumptions which are needed to accommodate special plan provisions which are not adequately covered in the first two categories. These would include (but are not limited to) items such as assumed family composition, plan expenses, election to specific benefit forms, etc. These assumptions need to be monitored so that they remain consistent with the plan provisions which are in effect.

In Tables III-A, III-B and III-C, we have prepared a summary of some of the assumptions being used by each plan in all three categories. For a comprehensive review of all assumptions being used for a particular plan, please refer to the July 1, 2003 Actuarial Valuation for that Fund.

In our opinion the assumptions used for July 1, 2003 valuations are reasonable and well within the mainstream of current actuarial practice. Experience during the 1997-2001 period has been analyzed for the Public Employees Police and Fire Fund. The approved changes in the assumptions for the plan has been included in the July 1, 2003 actuarial valuation.

#### ACTUARIAL METHODS

##### Asset Valuation Method

Effective with the July 1, 2000 actuarial valuation, Minnesota Statutes require that the asset value used for actuarial purposes spread differences between actual return (measured on a market-value basis) and expected return on non-MPRIF (non-RBF assets for MERF) assets over five years, in a

manner similar to that already being used within the MPRIF. The previous method required under Minnesota Statutes recognized one third of the unrealized gains and losses. An Asset Valuation Method requirement exists because market values (which include all unrealized gains and losses) are typically volatile and can produce erratic changes in the contribution requirements from year to year. The intent of the change to the current method is to employ a more effective asset smoothing technique which is market-value based and which eliminates artificial bias related to manager style. The effective date of this requirement is July 1, 2000 with full transition to be accomplished as of July 1, 2003.

The calculation of the Actuarial Value of Assets for each fund is determined as:

Market Value of Assets at June 30, 2003, *less*

80% of the current year Unrecognized Asset Return at July 1, 2003 (the difference between actual net return on Market Value of Assets between June 30, 2002 and June 30, 2003 and the asset return expected during that period based on the assumed interest rate employed in the July 1, 2002 Actuarial Valuation); *less*

60% of the current year Unrecognized Asset Return at July 1, 2002 (the difference between actual net return on Market Value of Assets between June 30, 2001 and June 30, 2002 and the asset return expected during that period based on the assumed interest rate employed in the July 1, 2001 Actuarial Valuation); *less*

40% of the current year Unrecognized Asset Return at July 1, 2001 (the difference between actual net return on Market Value of Assets between June 30, 2000 and June 30, 2001 and the asset return expected during that period based on the assumed interest rate employed in the July 1, 2000 Actuarial Valuation); *less*

20% of the current year Unrecognized Asset Return at July 1, 2000 (the difference between actual net return on Market Value of Assets between June 30, 1999 and June 30, 2000 and the asset return expected during that period based on the assumed interest rate employed in the July 1, 1999 Actuarial Valuation).

The term "Actuarial Value of Assets" is used to indicate that the value was determined for use in the actuarial valuations. Minnesota Statutes refer to this value as "Current Assets."

#### **Payment on the Unfunded Actuarial Accrued Liability**

Effective with the July 1, 2000 actuarial valuations, if the Current assets exceed the Actuarial Accrued Liability for any fund, the surplus amount shall be amortized over 30 years as a level percentage of payroll. Prior to July 1, 2000, some of the funds did not amortize the surplus amount, while others amortized to a fixed amortization date.

**TABLE III-A: JULY 1, 2003 ACTUARIAL ASSUMPTIONS - CATEGORY 1**  
*(Highlighted box indicates change from prior year.)*

Fund	Interest Rates Pre-retire/Post-retire	Salary Increase %/ Data Used	Social Security	COLA on Benefits
Public Employees (Chapter 353)	8.5%/6.0%	<sup>(2)</sup> /Prior Year Salary Increased	N/A	2.5% Implied by 6.0% Interest Rate
Police and Fire (Chapter 353)	8.5%/6.0%	<sup>(1)</sup> / Prior Year Salary Increased	N/A	2.5% Implied by 6.0% Interest Rate
Local Government Correctional Service (Chapter 353E)	8.5%/6.0%	<sup>(1)</sup> /Prior Year Salary Increased	N/A	2.5% Implied by 6.0% Interest Rate
State Employees (Chapter 352)	8.5%/6.0%	<sup>(2)</sup> /Prior Year Salary Increased	N/A	2.5% Implied by 6.0% Interest Rate
State Patrol (Chapter 352B)	8.5%/6.0%	<sup>(1)</sup> /Prior Year Salary Increased	N/A	2.5% Implied by 6.0% Interest Rate
Correctional (Chapter 352)	8.5%/6.0%	<sup>(1)</sup> /Prior Year Salary Increased	Current Law and 6.0% Salary Scale	2.5% Implied by 6.0% Interest Rate
Judges (Chapter 490)	8.5%/6.0%	Statutory Salary, Then 5.0%	N/A	2.5% Implied by 6.0% Interest Rate
Teachers (Chapter 354)	8.5%/6.0%	<sup>(2)</sup> /Prior Year Salary Increased	N/A	2.5% Implied by 6.0% Interest Rate
Duluth Teachers (Chapter 354A)	8.5%/6.5%	<sup>(2)</sup> /Reported Salary Increased	N/A	2% Implied by 6.5% Interest Rate
St. Paul Teachers (Chapter 354A)	8.5%/8.5%	<sup>(2)</sup> /Reported Salary Increased	N/A	2% Per Annum
Minneapolis Teachers (Chapter 354A)	8.5%/8.5%	<sup>(2)</sup> /Reported Salary Increased	N/A	2% Per Annum
Minneapolis Employees (Chapter 422A)	6.0%/5.0%	4.0%/Reported Pay Increased 1.0198%	N/A	1.0% Implied by 5.0% Interest Rate

(1) Graded rates using a 5.0% base increase plus a merit scale.

(2) Select and ultimate rates using a 5.0% base increase plus a merit scale plus a 10-year select period.



**TABLE III-B: JULY 1, 2003 ACTUARIAL ASSUMPTIONS - CATEGORY 2**

*(Highlighted box indicates change from prior year.)*

Fund	Pre-retirement Mortality Table (male rates shown)	Disability Table (male rates shown)	Retirement Age (Coordinated)	Other Separation (male rates shown)
Public Employees (Chapter 353)	1983 GAM Male set back 8 years	Graded: .05% @ 35 .49% @ 55	Graded from age 55 and separate graded rates for Rule of 90	Select and ultimate graded
Police and Fire (Chapter 353)	1983 GAM Male set back 6 years	Graded: .19% @ 35 2.03% @ 55	Graded from age 50	Select and ultimate graded
Local Government Correctional Service (Chapter 353E)	1983 GAM Male set back 1 year	Graded: .11% @ 35 .88% @ 55	Graded from age 50	Graded: 6.00% @ 35 1.40% @ 55
State Employees (Chapter 352)	1983 GAM Male set back 5 years	Graded: .03% @ 35 .42% @ 55	Graded from age 55 and separate graded rates for Rule of 90	Select and ultimate graded
State Patrol (Chapter 352B)	1983 GAM Male set back 1 year	Graded: .11% @ 35 .88% @ 55	Graded from age 50	Graded: 0.70% @ 35 0.00% @ 55
Correctional (Chapter 352)	1983 GAM Male set back 1 year	Graded: .11% @ 35 .88% @ 55	Graded from age 50	Graded: 6.00% @ 35 1.40% @ 55
Judges (Chapter 490)	1983 GAM Male set back 4 years	Graded: .02% @ 35 .34% @ 55	Graded from age 62	None
Teachers (Chapter 354)	1983 GAM Male set back 12 years	Graded: .01% @ 35 .22% @ 55	Graded from age 55 and separate graded rates for Rule of 90	Select and ultimate graded
Duluth Teachers (Chapter 354A)	1983 GAM Male set back 10 years	Graded: .01% @ 35 .15% @ 55	Graded from age 55 40% under Rule of 90	Select and ultimate graded
St. Paul Teachers (Chapter 354A)	1983 GAM Male set back 7 years	Graded: .03% @ 35 .50% @ 55	Graded from age 55	Select and ultimate graded
Minneapolis Teachers (Chapter 354A)	1983 GAM Male set back 12 years	Graded: .01% @ 35 .15% @ 55	Graded from age 55	Select and ultimate graded
Minneapolis Employees (Chapter 422A)	1986 Projected Exp. Table set back 1 year	Graded: .30% @ 35 1.60% @ 55	Age 61	Graded: 1.50% @ 35 1.00% @ 55

**TABLE III-B: JULY 1, 2003 ACTUARIAL ASSUMPTIONS - CATEGORY 2**

*(Highlighted box indicates change from prior year.)*

Fund	Post-Retirement Mortality Table (Male rates shown)	Post-Retirement Mortality Table (Female rates shown)	Post-Disability Mortality Table (Male rates shown)	Post-Disability Mortality Table (Female rates shown)
Public Employees (Chapter 353)	1983 GAM Male set back 1 year	1983 GAM Female set back 1 year	1965 RRB thru age 54. Graded to Post-Retirement table at age 65.	1965 RRB thru age 54. Graded to Post-Retirement table at age 65.
Police and Fire (Chapter 353)	1983 GAM Male set back 1 year	1983 GAM Female set back 1 year	1965 RRB thru age 40. Graded to Post-Retirement table at age 60.	1965 RRB thru age 40. Graded to Post-Retirement table at age 60.
Local Government Correctional Service (Chapter 353E)	1983 GAM Male set forward 2 years	1983 GAM Female set forward 2 years	Combined Annuity Mortality Table	Combined Annuity Mortality Table
State Employees (Chapter 352)	1983 GAM Male set back 2 years	1983 GAM Female set back 1 year	1965 RRB thru age 54. Graded to Post-Retirement table at age 65.	1965 RRB thru age 54. Graded to Post-Retirement table at age 65.
State Patrol (Chapter 352B)	1983 GAM Male set forward 2 years	1983 GAM Female set forward 2 years	Combined Annuity Mortality Table	Combined Annuity Mortality Table
Correctional (Chapter 352)	1983 GAM Male set forward 2 years	1983 GAM Female set forward 2 years	Combined Annuity Mortality Table	Combined Annuity Mortality Table
Judges (Chapter 490)	1983 GAM Male	1983 GAM Female	Combined Annuity Mortality Table	Combined Annuity Mortality Table
Teachers (Chapter 354)	1983 GAM Male set back 6 years	1983 GAM Female set back 3 years	1965 RRB thru age 54. Graded to Post-Retirement table at age 65.	1965 RRB thru age 54. Graded to Post-Retirement table at age 65.
Duluth Teachers (Chapter 354A)	1983 GAM Male set back 2 years	1983 GAM Female	1977 RRB	1977 RRB
St. Paul Teachers (Chapter 354A)	1983 GAM Male set back 3 years	1983 GAM Female set back 1 year	1977 RRB	1977 RRB
Minneapolis Teachers (Chapter 354A)	1983 GAM Male set back 4 years	1983 GAM Female set back 1 year	1977 RRB	1977 RRB
Minneapolis Employees (Chapter 422A)	1986 Projected Exp. Table set back 1 year	1986 Projected Exp. Table set back 1 year	1986 Projected Exp. Table set back 1 year	1986 Projected Exp. Table set back 1 year

**TABLE III-C: JULY 1, 2003 ACTUARIAL ASSUMPTIONS - CATEGORY 3**

*(Highlighted box indicates change from prior year.)*

Fund	Family Composition (Male/Female)	Expenses (Admin. Only)	Bounceback Annuity Election (Male/Female)	Other
Public Employees (Chapter 353)	85%/65% married; no children	Prior year as % of payroll	10%/ 5% for 25% J&S 20%/ 5% for 50% J&S 10%/ 5% for 75% J&S 30%/15% for 100% J&S	0.8%/60% load on liabilities for Members/former Members for Combined Service Annuities
Police and Fire (Chapter 353)	85%/65% married; no children	Prior year as % of payroll	40%/15% for 50% J&S 45%/15% for 100% J&S	0%/30% load on liabilities for Members/former Members for Combined Service Annuities
Local Government Correctional Service (Chapter 353E)	85%/85% married;	Prior year as % of payroll	25%/5% for 50% J&S 25%/5% for 100% J&S	0%/30% load on liabilities for Members/former Members for Combined Service Annuities
State Employees (Chapter 352)	85%/85% married	Prior year as % of payroll	20%/10% for 50% J&S 50%/15% for 100% J&S	1.2%/40% load on liabilities for Members/former Members for Combined Service Annuities
State Patrol (Chapter 352B)	100%/100% married; two children	Prior year as % of payroll	25%/ 5% for 50% J&S 25%/ 5% for 100% J&S	0%/30% load on liabilities for Members/former Members for Combined Service Annuities
Correctional (Chapter 352)	85%/85% married	Prior year as % of payroll	25%/ 5% for 50% J&S 25%/ 5% for 100% J&S	0%/30% load on liabilities for Members/former Members for Combined Service Annuities

**TABLE III-C: JULY 1, 2003 ACTUARIAL ASSUMPTIONS - CATEGORY 3**

*(Highlighted box indicates change from prior year.)*

Fund	Family Composition (Male/Female)	Expenses (Admin. Only)	Bounceback Annuity Election (Male/Female)	Other
Judges (Chapter 490)	Actual data	Prior year as % of payroll	None	No refunds 0%/30% load on liabilities for Members/former Members for Combined Service Annuities
Teachers (Chapter 354)	85%/65% married; no children	Prior year as % of payroll	15%/20% for 50% J&S 25%/10% for 75% J&S 55%/30% for 100% J&S	1.4%/4% load on liabilities for Members/former Members for Combined Service Annuities
Duluth Teachers (Chapter 354A)	80%/80% married	Prior year as % of payroll	35/25% for 50% J&S 55%/25% for 100% J&S	10%/10% load on liabilities for Members/former Members for Combined Service Annuities
St. Paul Teachers (Chapter 354A)	85%/60% married; two children	Prior year as % of payroll	10%/10% for 50% J&S 45%/10% for 100% J&S	Benefit increase = (5 yr. return - 8.50%) x (1 - contribution deficiency) 7.0%/30% load on liabilities for Members/former Members for Combined Service Annuities
Minneapolis Teachers (Chapter 354A)	80%/60% married	Prior year as % of payroll	15%/15% for 50% J&S 20%/ 5% for 75% J&S 40%/15% for 100% J&S	Benefit increase = (5 yr. return - 8.50%) x (1 - contribution deficiency) 4.0%/30% load on liabilities for Members/former Members for Combined Service Annuities
Minneapolis Employees (Chapter 422A)	67%/67% married	Prior year increased by 4% as % of payroll	None	Investment expense amortized to a required date 0.2%/30% load on liabilities for Members/former Members for Combined Service Annuities

## Alternative Analysis of Funded Status

The dollar-weighted rates of return on the market value of assets for the Basic Funds over the three prior fiscal years have been gains/(losses) of approximately (7.25%), (8%), and 2%, respectively. The rates of return on the market value of assets for the funds that are not managed by the State Board of Investments have also been negative for the 2001 and 2002 fiscal years ranging from approximately -3.6% each year for St. Paul Teachers to over -11% each year for Minneapolis Teachers. For the 2003 fiscal year, the returns have ranged from about 0.4% for Minneapolis Employees to about 3.5% for Duluth Teachers. When the rates of return are less than the actuarially assumed rate of return, an actuarial loss on assets occurs. These asset losses have serious short-term and long-term implications for the funded status of retirement plans. This Appendix A will explore these implications further. The Tables A-1 through A-4 use the statutory definitions of actuarial value and market value of assets, i.e. the market value includes the "required reserve" for the MPRIF (RBF for MERF) rather than the market value. The implications of the asset losses on the investment-based COLAs is discussed in more detail below.

### Current Funded Status

Currently, all of the retirement funds included in this report have sufficient assets to pay benefits to annuitants for the next several years. The only fund that has a credible threat to the fund's ability to pay benefits in the near future is the Minneapolis Teachers Retirement Fund Association. Absent further investment losses, this fund may be expected to have sufficient assets to pay benefits when due for at least the next 7 years. Consequently, action to "bail out" any of the retirement funds is not a critical necessity at this time, but time is getting short for the MTRFA.

As of July 1, 2003, the asset valuation method produces an actuarial value of assets that is greater than market value of assets for all of the plans. The relationship between the actuarial value of assets and the market value of assets is presented in Table A-1. The separate presentation of the First Class City Teacher funds from the other funds is due to the different mechanisms for determining the investment based COLAs. These separate mechanisms and the implications of the asset losses are discussed in greater detail below.

All plan benefits and expenses must be paid for through contributions to the plan and investment earnings on assets held by the plan. In a defined benefit plan, plan costs are not known until after all benefits have been paid to the last benefit recipient. In order to assign plan costs to specific time periods, an actuarial valuation is performed. We measure funding status and/or progress in order to achieve equity between generations of taxpayers and members (generational equity). One aspect of generational equity is to determine a relatively stable and predictable level of costs that will accumulate sufficient funds to pay benefits when they are due.

A portion of the allocation of the plan costs is the valuation of the fund's assets. Plan sponsors typically invest plan funds in asset classes that are expected to generate an adequate long-term rate of return. In order to achieve higher returns, plan sponsors must accept higher risk. This higher risk generally manifests itself in short-term variations in the market value of assets. Since the pension plan liabilities are a long-term commitment and one of the funding goals is to produce a relatively stable measure of plan costs, the value that the actuary places on the plan assets to determine plan

costs is often smoothed in order to reduce effects of the short-term asset volatility on long-term plan costs.

As is illustrated in Table A-1, the actuarial value of assets exceeds the market value of assets for all of the funds included in these tables. One question that may occur is "What is the right measure of the fund assets?" We assert that neither measure of assets is necessarily "right" or "wrong." Even in retrospect, one cannot really "know" what the appropriate value of a given asset is or was except at the time it is liquidated to satisfy a given liability. Nonetheless, given the significant difference it is prudent to examine the implications of the lower market value.

### **Implications of Asset Losses on Investment-based COLAs**

Generally, the Minnesota retirement funds provide two types of Cost of Living Adjustments (COLAs.) The first type is related to price inflation, and the second type is related to investment performance. There are two variations in the calculation of the investment based COLA: funds that have a separate post-retirement fund such as the Minnesota Post-Retirement Investment Fund (MPRIF) and funds that do not have a segregated post-retirement fund. These two types of funds have different methods for determining the amount of the investment based COLA, and these different allocation methods have different implications for future COLAs and future funding requirements.

### **Plans With Separate Post-retirement Funds**

The statutory mechanism for determining the amount of the COLA for plans that have a separate post-retirement fund uses a 5-year asset smoothing technique that is similar to the smoothing method used in the actuarial valuation. When the smoothed value of asset gains and (losses) is positive, an investment based COLA is payable. After the 2001 and 2002 fiscal years of negative asset returns combined with the low return for the 2003 fiscal year, the smoothed value of asset gains and (losses) is negative. Consequently, no investment based COLAs are payable. This statutory mechanism requires that the negative value of the smoothed gains and (losses) be carried forward to future years prior to determining if any investment based COLA is payable. Due to the size of the last three years of investment losses, this "negative carry forward" is very large. Consequently, we expect that the only COLA adjustments that will be payable in the foreseeable future for these plans will be the inflation component.

We note that the market value of assets in the post-retirement funds is less than the actuarially required reserve for all of the funds. As discussed in the previous section, all of the plans with a separate post-retirement fund have sufficient assets to pay benefits to annuitants for the next several years. If assets continue to decline, then at some point there may be a nonzero probability that the plans will not be able to pay benefits when due. It is our understanding that there is currently no statutory mechanism that addresses this situation. In the unlikely event that such a situation were to develop, there would be three possible ways to handle this situation:

1. Provide for a transfer of funds from the plan's active fund to the post-retirement fund.
2. Provide for a transfer of funds from the State.
3. Reduce or eliminate benefits to annuitants.

We do not believe that the funding levels in the post-retirement funds are low enough to warrant any action at this time, particularly in light of the favorable asset returns between July 1, 2003 and December 31, 2003. We suggest continued monitoring of these funds over the next few years; this may be particularly important with regard to MERF's Retirement Benefit Fund, due to the closed nature of this plan.

### **Plans Without Separate Post-retirement Funds**

The First Class City Teacher funds also provide investment-based COLAs. The statutory mechanism to provide investment based COLAs in these funds is based on the five-year average rate of return of the entire fund. If the average return exceeds the actuarially assumed investment rate (8.5%), then an investment based COLA is payable. Given the negative rate of return of the last two fiscal years and the low return for the 2003 fiscal year, we expect that there will be no investment based COLAs in these funds for the next 4 years. Unlike the plans with a separate post-retirement fund, the statutory mechanism in First Class City Teacher funds has no provision to recover the asset losses before any investment based COLAs are granted. Consequently, it is possible that these plans will provide increases to retirees that will be paid by current members and taxpayers. If these circumstances occur, then the funded status of these plans will deteriorate (perhaps rapidly.) Of particular concern is Minneapolis Teachers. The retired life liability in this plan currently exceeds its assets. The negative returns of the 2001 and 2002 fiscal years and small positive return for the 2003 fiscal year assure that the 5-year average return will be less than 8.5% for the next year or two. Since retiree benefits are not reduced in these situations, it is likely that there will be "negative" dividend amounts that are never recovered, thus further exacerbating a very poor funding position.

### **Future Funding Implications**

In the last three fiscal years, the funds have experienced significant asset losses. Under the asset smoothing method that is prescribed by Minnesota Statutes, the recognition of these losses is spread over five years. This deferred recognition means that the asset losses from the 2001 through 2003 fiscal years will contribute to actuarial losses in future years. Unless the funds earn investment returns that are substantially higher than the assumed 8.5% rate, recognized asset experience will be a loss. Table A-2 shows the expected asset loss that will be recognized in the July 1, 2004 actuarial valuation if the active portion of the respective fund earns exactly 8.5% on a market value basis.

If the current market value of assets is considered to be more representative of the long-term value of plan assets, then the funded status of the plans is much worse than is presented in the official July 1, 2003 actuarial valuations. Table A-3 shows the accrued liability funded ratio for each fund on both an actuarial value of assets and on a market value of assets basis. As can be seen in these tables, all of the funds have lower funded ratios on a market value basis and only MSRS State Patrol has an accrued liability funded ratio in excess of 100%.

Similarly in Table A-4, we show a rough calculation of what the sufficiency/(deficiency) measure would be if we fully recognized current market values at July 1, 2003. In making these calculations, we did not consider any possible change in amortization periods for those plans that currently have positive unfunded actuarial liabilities. For those that would switch from negative to positive, we used a 30-year amortization factor.

As noted earlier, we cannot know with certainty which set of numbers presents a more realistic assessment of the current funded status of these plans. It is likely that the "right" answer is somewhere in between these results, but even that is not a certain conclusion. We believe that it is prudent to consider both before taking any legislative action. While appropriate steps are encouraged, considering a range of results should help to avoid any under or over reaction to the situation. For emphasis, we point out that all of the plans which we identified as candidates for consideration of increases in statutory contribution rates are more severely deficient when measured on a market value basis.



Table A-1

June 30, 2003 – Relationship of Current Assets to Market Value of Assets

(\$ in Thousands)

	Current Assets	Market Value	Ratio
<b><u>Plans With Segregated Post-Funds</u></b>			
PERA – General	11,195,902	10,240,029	109%
PERA – Police & Fire	4,713,606	4,177,661	113%
PERA – Local Correctional	56,487	49,834	113%
MSRS – State Employees	7,757,292	6,883,753	113%
MSRS – State Patrol	591,521	539,463	110%
MSRS – Correctional	470,716	418,744	112%
MSRS – Judges	134,142	128,164	105%
TRA	17,384,179	15,907,892	109%
MERF	1,519,421	1,471,326	103%
<b><u>Plans Without Segregated Post-Funds</u></b>			
DTRFA	278,467	231,247	120%
MTRFA	956,913	719,599	133%
StPTRFA	898,760	757,640	119%

Table A-2

Deferred Asset Losses That  
Will Be Recognized July 1, 2004

	<i>(\$ in thousands)</i>
<b><u>Plans With Segregated Post-Funds</u></b>	
PERA – General	(431,029)
PERA – Police & Fire	(240,103)
PERA – Local Correctional	(2,693)
MSRS – State Employees	(394,624)
MSRS – State Patrol	(23,475)
MSRS – Correctional	(23,213)
MSRS – Judges	(2,637)
TRA	(668,354)
MERF	(21,742)
<b><u>Plans Without Segregated Post-Funds</u></b>	
DTRFA	(20,876)
MTRFA	(108,484)
StPTRFA	(61,745)

Table A-3

July 1, 2003 – Actuarial Accrued  
Liability Funding Ratios

	Current Asset Basis	Market Value Basis
<b><i>Plans With Segregated Post-Funds</i></b>		
PERA – General	81.27%	74.33%
PERA – Police & Fire	107.35%	95.14%
PERA – Local Correctional	90.32%	79.68%
MSRS – State Employees	99.06%	87.91%
MSRS – State Patrol	109.75%	100.09%
MSRS – Correctional	97.06%	86.34%
MSRS – Judges	76.09%	72.70%
TRA	103.13%	94.37%
MERF	92.31%	89.39%
<b><i>Plans Without Segregated Post-Funds</i></b>		
DTRFA	95.66%	79.44%
MTRFA	57.23%	43.04%
StPTRFA	75.57%	63.70%

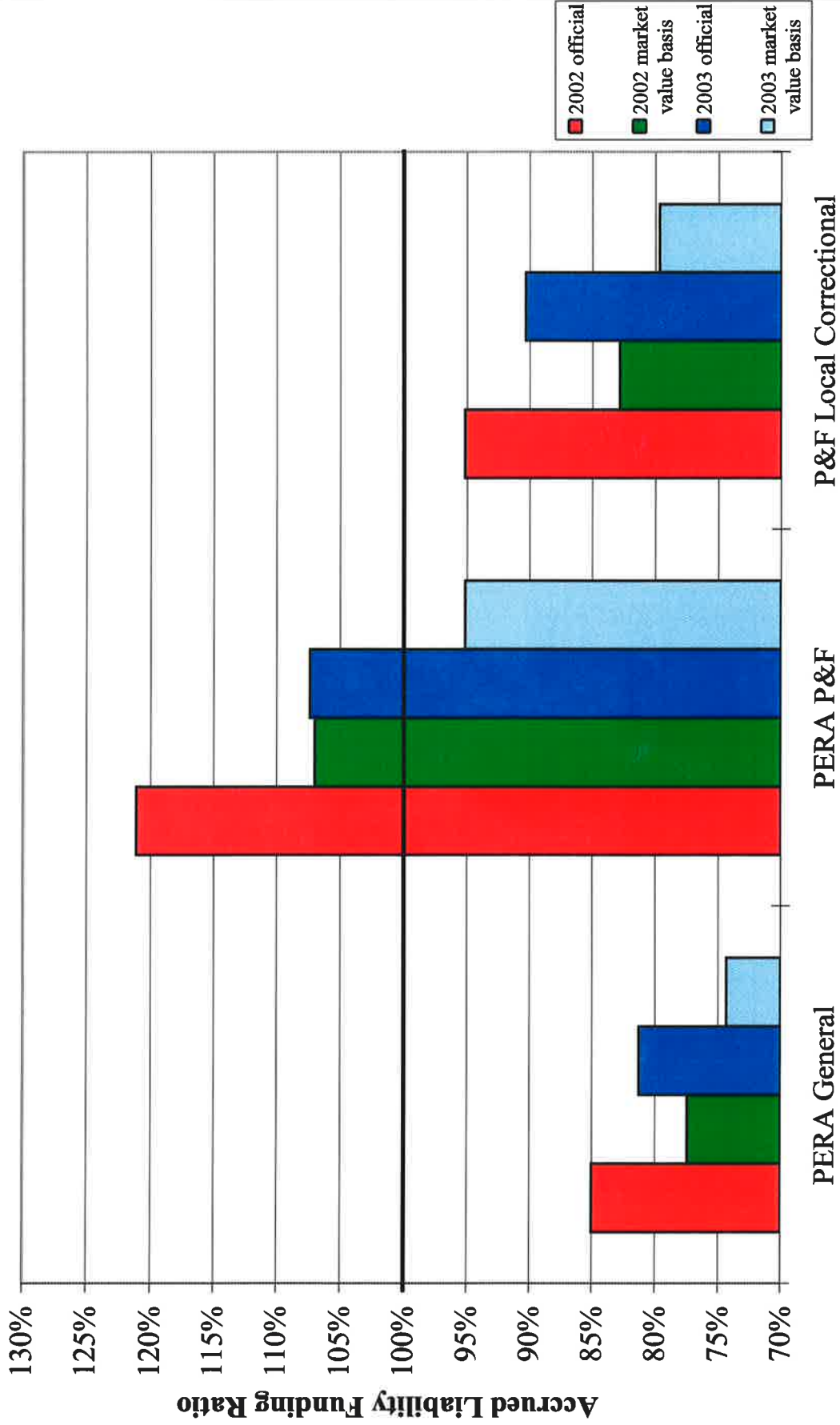
Table A-4

2003-04 Contribution  
Sufficiency/(Deficiency) Measure

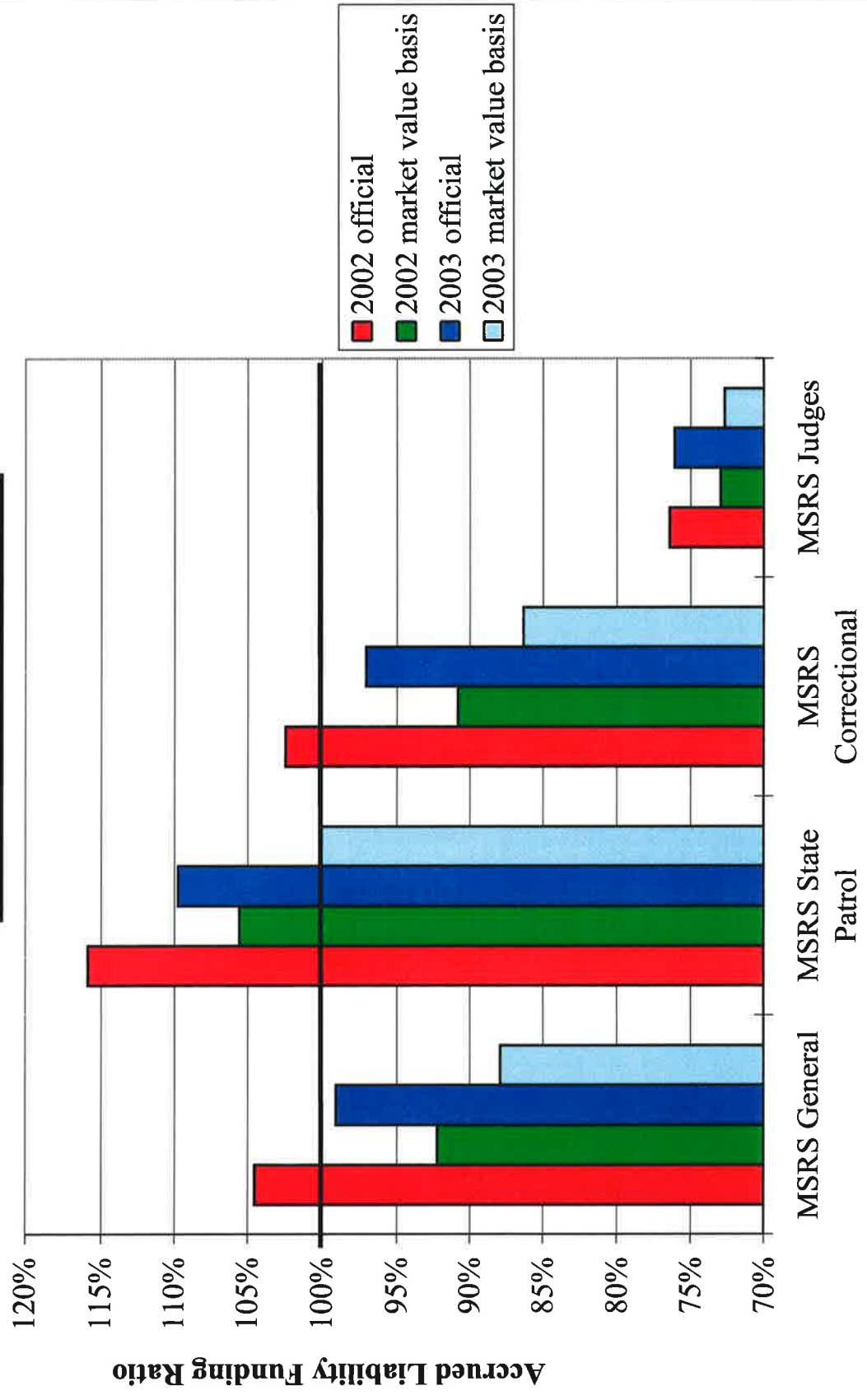
	Current Asset Basis	Market Value Basis
<i><u>Plans With Segregated Post-Funds</u></i>		
PERA – General	-1.24%	-2.38%
PERA – Police & Fire	-4.02%	-8.42%
PERA – Local Correctional	0.45%	0.08%
MSRS – State Employees	-1.43%	-3.67%
MSRS – State Patrol	3.19%	-1.76%
MSRS – Correctional	-2.16%	-4.22%
MSRS – Judges	1.69%	0.31%
TRA	1.63%	-0.88%
MERF	0.01%	-11.87%
<i><u>Plans Without Segregated Post-Funds</u></i>		
DTRFA	0.02%	-4.88%
MTRFA	-9.47%	-16.54%
StPTRFA	-3.46%	-8.33%

**SUMMARY CHARTS OF LIABILITY FUNDING RATIOS**

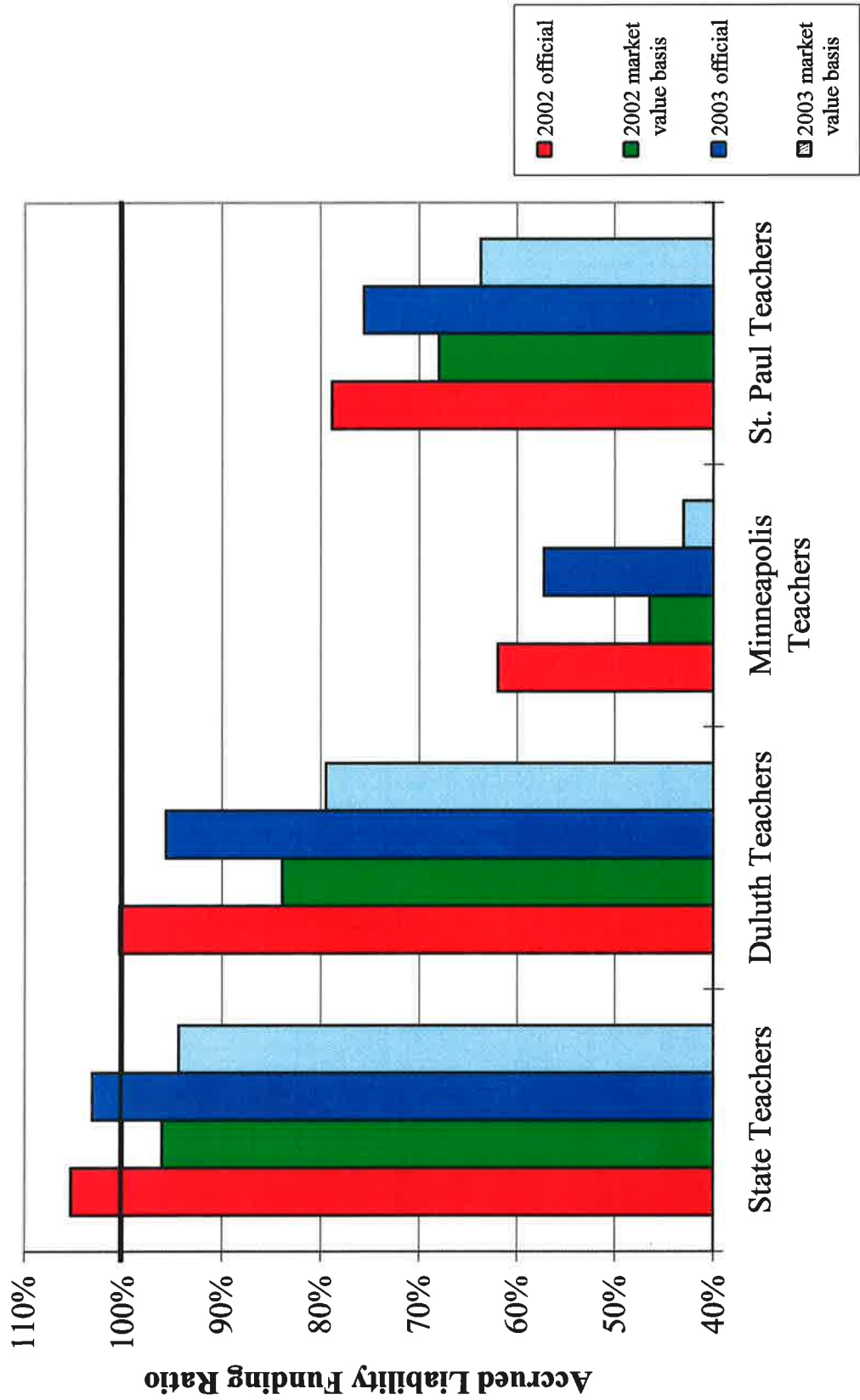
# FUNDING RATIOS PERA



# FUNDING RATIOS MSRS



# FUNDING RATIOS TEACHER PLANS





# FUNDING RATIOS MERF

