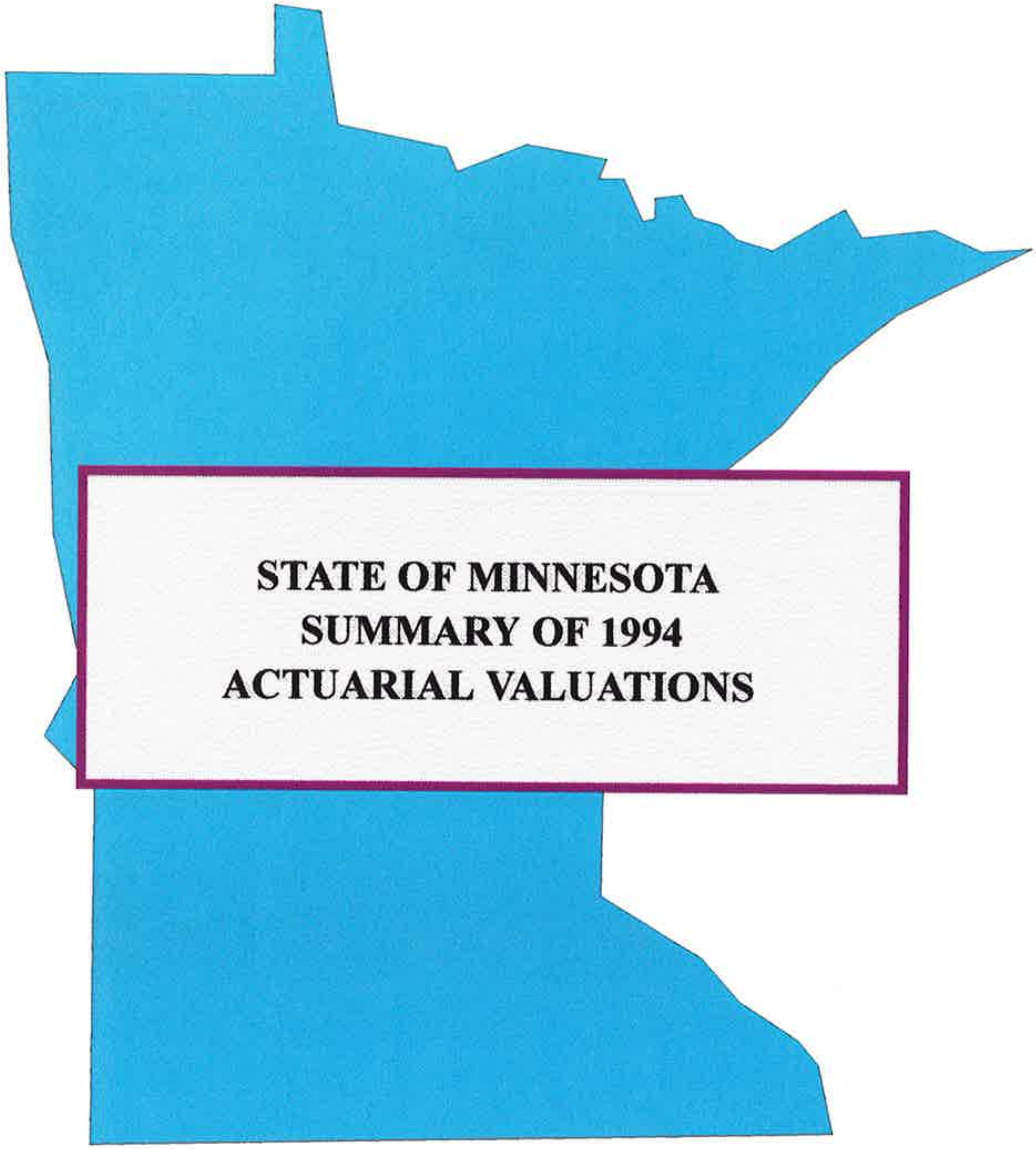

STATE OF MINNESOTA SUMMARY OF 1994 ACTUARIAL VALUATIONS

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February 10, 1995

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, 1994 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 1994-95 funding levels, as well as summaries of significant plan changes and actuarial assumptions used.

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,

Thomas K Custis

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TKC/WVH/bh

STATE OF MINNESOTA

SUMMARY OF 1994 ACTUARIAL ASSUMPTIONS

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STATE OF MINNESOTA

SUMMARY OF 1994 ACTUARIAL ASSUMPTIONS

I. 1994-95 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%.

Below we comment by plan on our analysis of the actuarial valuations. In addition to each plan's own funding requirements, we make note of the adoption by GASB of statement Nos. 25, 26 and 27. These statements may change the reporting requirements of each plan consequently altering the information required to be presented in these reports.

PERA

1. The Public Employees plan showed a modest deficiency for 1993. This deficiency increased in 1994 mainly due to assumption changes with respect to salaries and mortality. Funding ratios have remained level for current accruals of benefits and projected benefit funding. Total active membership increased by about 4.5%. The deficiency is now at a level which suggests very close monitoring. Unless favorable experience in the next year or two reduces this deficiency, some change in statutory rates may be called for.

2. The Police and Fire plan continues to be in a well-funded position. Both the sufficiency numbers and the funding ratios support this conclusion.

3. The Police and Fire Consolidation plan requires substantial contribution levels. Since the statutes require full current funding, no deficiency is noted however the required rate is still over 30% of payroll with this valuation. Significant actuarial gains have contributed to an increase in the funding ratio and a decrease in the total required contribution as a percent of payroll. Both the Accrued Benefit and Accrued Liability ratios are now over 85%. Ten new consolidation accounts were added which, in general, improved the funding ratios after the election of PERA benefits by a significant portion of the Members. Another issue of concern is the ability of each individual consolidation account to transfer the required reserves for new retirees to MPRIF. In Table I-D, we present a brief analysis of each consolidation plan's ability to make the required transfer of MPRIF reserves out of existing assets.

MSRS

4. The State General Employees plan shows a modest contribution deficiency. The funding ratios dropped slightly from the prior year. The plan experienced investment and other data related losses which increased the contribution deficiency. The change in assumptions with respect to salary and mortality had very little impact on the contribution deficiency. Like the Public Employees plan, this deficiency level is approaching a level of real concern. If it persists, corrective statutory action should be considered.

5. The State Patrol plan shows a contribution sufficiency which is higher than last year primarily due to a plan amendment eliminating the pre-73 6% increase and gains related to salary increases. General accrued benefit funding ratios are slightly higher than last year.

6. The State Correctional Employees plan shows a small contribution deficiency. We believe this is due mainly to a significant increase in membership over last year.

7. The Legislators plan is funded on a terminal funding basis. This 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 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).

Not surprisingly, Table I-C continues to show low funding ratios for these plans year after year. We recommend consideration of moving to a pre-funded basis similar to that recently adopted for the Judges plan.

8. The Judges plan actuarial funding requirement increased due to actuarial losses related to investment return, mortality and other data. While the funding ratios continue to improve, precautions should still be taken against short-term cash shortages.

TEACHERS

9. The Teachers Retirement Association plan showed the same small contribution deficiency for 1994 as it did for 1993. This is the result of a combination of offsetting items related to a change in benefit factors and contribution rates, a change in actuarial assumptions and overall actuarial losses during the year. The accrued benefit funding ratios showed a decrease over the prior year, primarily due to a loss on assets.

10. The Duluth Teachers plan has a contribution deficiency of .07% this year compared to a sufficiency of 0.08% of payroll last year. This plan experienced actuarial losses in the prior year which resulted in lower accrued benefit funding ratios as well.

11. The St. Paul Teachers plan contribution deficiency has improved since the last valuation. Most of this improvement is attributable to increased contributions. At 3.18% of payroll, however, the size of this deficiency still warrants attention. While new contribution rates have taken effect on July 1, 1994, it appears that further increases in funding rates will be necessary.

12. The Minneapolis Teachers plan showed noticeable improvement in the contribution deficiency from last year. This improvement was primarily due to increased contributions (including school, city and matching state contributions). **While, improved, this deficiency remains a serious problem requiring further corrective action.** Accrued funding ratios continue to show improvement, but are still very low.

MERF

13. The Minneapolis Employees Retirement Fund is a closed plan with no new active employees. The Statutory Funding requirements are structured to assure full funding of actuarial accrued liability by the year 2020. We note that the funding requirement as a percent of pay increased from the prior valuation due primarily to significant actuarial losses. Accrued funding ratios were marginally lower from the prior valuation.

MERF has its own Retirement Benefit Fund which operates in a manner parallel to the MPRIF. The Commissioner should be aware that investment performance the last two years has fallen significantly short of levels necessary to adequately fund the cost-of-living adjustments made in retiree benefits. The program is designed to recover this deficiency from future investment returns. Due to the closed nature of this group, however, there is some potential that this shortfall may not be recovered. This "contingent liability" has not been specifically recognized in this valuation but should be monitored closely until the RBR is in a positive situation.

We believe the Commission should attempt to focus legislative consideration on the following priorities:

- Consider initiating pre-funding in the Legislators and Elective State Officers plans.

- Closely monitor the funding status of the Public Employees' and State General Employees' plans. While not yet at the critical stage, any legislative action which may put additional pressure on these funds could be very damaging.

- Continue to assess the underfunding problems of the MTRFA and St.PTRFA plans.

    - Clearly Minneapolis Teachers' Retirement Fund is in the most precarious position. Continued improvement from last year to this year should not cause any false hope. Even considering the special additional contributions enacted last year, this plan still needs additional corrective action.

- The St. Paul Teachers' Retirement Fund status is better than it was last year. The ultimate scheduled contribution rate of 8.14% for Coordinated Members may be enough to achieve sufficiency once the current level of unfunded actuarial liability is appropriately addressed.

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

TABLE I-A: 1994-95 FUNDING LEVELS (PERCENTAGES)

Fund	Section 356.215 Requirements				Statutory Requirement			Sufficiency (Deficiency)
	Normal Cost	Supple-mental Cost	Expense	Total	Employee	Employer	Total	
Public Employees (Chapter 353)	6.75%	2.84%	0.17%	9.76%	4.30%	4.60%	8.90%	(0.86)%
Police and Fire (Chapter 353)	19.47	(2.31)	0.12	17.28	7.60	11.40	19.00	1.72
Police and Fire Consolidation	21.03	12.60*	0.00	33.63	7.60	26.03	33.63	0.00
State Employees (Chapter 352)	6.67	2.36	0.12	9.15	4.07	4.20	8.27	(0.88)
State Patrol (Chapter 352B)	20.08	1.55	0.16	21.79	8.50	14.88	23.38	1.59
Correctional (Chapter 352)	10.81	0.32	0.17	11.30	4.90	6.27	11.17	(0.13)
Legislators (Chapter 3A)	19.19	18.80	0.35	38.34	9.00	Terminal Funding	N/A	N/A
Elective State Officers (Chapter 352C)	15.38	26.40	0.22	42.00	9.00	Pay-as-you-go funding	N/A	N/A
Judges (Chapter 490)	17.68	10.47	0.12	28.27	6.36	22.00	28.36	0.09
Teachers (Chapter 354)	10.63	3.95	0.15	14.73	6.51	8.15	14.66	(0.07)
Duluth Teachers (Chapter 354A)	9.22	0.38	0.76	10.36	4.50	5.79	10.29	(0.07)
St. Paul Teachers (Chapter 354A)	11.48	6.90	0.25	18.63	6.05	9.30**	15.45	(3.18)
Minneapolis Teachers (Chapter 354A)	12.36	12.31	0.36	25.03	6.25	12.91**	19.16	(5.87)
Minneapolis Employees (Chapter 422A)	18.62	25.90	1.69	46.21	9.75	36.46**	46.21	0.00

*Equal to the total statutory requirement less the normal cost.

**Includes State contributions of 0.36% for St. Paul Teachers, 12.14% for Minneapolis Employees, and total special contributions of 3.02% for Minneapolis Teachers.

TABLE I-B: PATTERN OF SUFFICIENCY (DEFICIENCY): 1992-1994

Fund	Actuarial Requirements			Statutory Requirements			Sufficiency (Deficiency)		
	1992	1993	1994	1992	1993	1994	1992	1993	1994
Public Employees	9.95%(2)	9.58%(2)	9.76%(2)	9.10%	9.04%	8.90%	(0.85)%	(0.54)%	(0.86)%
Police & Fire	18.05(2)	17.45(1),(2)	17.28	20.00	19.50(3)	19.00(3)	1.40	2.05	1.72
Police & Fire Consolidation	54.55(2)	43.82	33.63	54.55	43.82	33.63	0.00	0.00	0.00
State Employees	8.27(2)	8.93(1),(2)	9.15(2)	8.11(3)	8.27(3)	8.27	(0.16)	(0.66)	(0.88)
State Patrol	22.27(2)	21.94(2)	21.79(1)	23.38	23.38	23.38	1.11	1.44	1.59
Correctional	11.41(2)	10.97(2)	11.30	11.17	11.17	11.17	(0.24)	0.20	(0.13)
Legislators	30.49(2)	31.12(2)	38.34	T.F.	T.F.	T.F.	N/A	N/A	N/A
Elective State Officers	36.23(2)	38.64(2)	42.00	P.A.Y.G.	P.A.Y.G.	P.A.Y.G.	N/A	N/A	N/A
Judges	26.59(2)	26.29(2)	28.27	28.38	28.36	28.36	1.79	2.07	0.09
Teachers	13.13(2)	12.75(2)	14.73(2)	12.72	12.68	14.66	(0.41)	(0.07)	(0.07)
Duluth Teachers	11.42(2)	10.21(2)	10.36	10.29	10.29	10.29	(1.13)	0.08	(0.07)
St. Paul Teachers	19.74(1),(2)	18.68(2)	18.63	15.09	15.37(3)	15.45	(4.65)	(3.31)	(3.18)
Minneapolis Teachers	27.43(2)	25.83(2)	25.03	15.86	15.29	19.16	(11.57)	(10.54)(4)	(5.87)
Minneapolis Employees	44.57(2)	44.37(2)	46.21	44.57	44.37	46.21	0.00	0.00	0.00

(1) Substantive benefit change implemented.
(2) Assumption or methodology change implemented.
(3) Change in Statutory Rate implemented.
(4) Does not reflect special State, City, School Board contributions; based on maximum legislated special contributions, this deficiency would be (6.80)%.

TABLE I-C: ACCRUED BENEFIT FUNDING RATIOS: 1992-1994
(DOLLARS IN MILLIONS)

Fund	Current Assets			P.V. of Accrued Benefit			A.B. Funding Ratio		
	1992	1993	1994	1992	1993	1994	1992	1993	1994
Public Employees	$3,978	$4,374	$4,747	$4,868	$5,164	5,626(2)	81.72%	84.71%	84.38%
Police & Fire	980	1,118	1,235	822	932(1)	1,021	119.28	119.95(1)	120.96
Police & Fire Consolidation	178	357	637	223	433	704	79.90	82.41	90.43
State Employees	2,613	2,906	3,158	2,745	3,057	3,376(2)	95.21	95.02	93.54
State Patrol	222	244	263	224	247	264	99.04	98.68	99.34
Correctional	121	136	148	106	116	131	114.63	117.30	112.70
Legislators	15	17	19	32	35	43	46.97	49.06	43.22
Elective State Officers	0.3	0.3	0.4	2.3	2.5	2.7	14.72	12.64	13.28
Judges	38	44	50	81	87	95	46.54	50.50	53.15
Teachers	6,325	7,046	7,612	6,997	7,608	8,464(2)	90.40	92.62	89.94
Duluth Teachers	116	131	134	116	125	129	100.71	105.04	103.56
St. Paul Teachers	356	393	407	503(1),(2)	539	564	70.77	72.91	72.16
Minneapolis Teachers	458	502	514	795(2)	836	874	57.60	60.02	58.81
Minneapolis Employees	838	889	909	1,092	1,135	1,170	76.78	78.30	77.72

(1) Substantive benefit change implemented.
(2) Assumption or methodology change implemented.

TABLE I-D: PERA CONSOLIDATION ACCOUNTS SUFFICIENCY FOR MPRIF TRANSFERS

Consolidation Account	# Eligible to Retire Now	Add'l # Eligible Within 5 Years	Current Assets	MPRIF Reserve	Comment Code
Albert Lea Fire	8	4	$10,729,053	$ 3,961,464	A
Albert Lea Police	4	5	8,682,508	2,988,538	A
Anoka Police	2	0	2,635,372	1,802,320	B
Austin Police	2	5	9,405,953	6,477,671	B
Bloomington Police	13	16	39,975,801	13,380,241	A
Buhl Police	0	0	1,013,675	847,508	A
Chisholm Fire	2	0	1,619,770	1,357,350	D
Chisholm Police	1	0	1,081,053	965,168	D
Columbia Heights Fire	1	0	1,742,658	1,117,550	A
Columbia Heights Police	3	1	3,359,497	2,450,814	C
Crookston Fire	3	3	1,117,774	357,483	C
Crystal Police	4	2	8,053,811	3,193,164	A
Duluth Fire	29	33	26,888,329	23,809,713	B*
Duluth Police	17	26	35,870,821	22,440,043	B*
Faribault Fire	3	3	4,321,999	3,169,959	C
Fridley Police	2	5	7,307,204	3,522,736	A
Hibbing Fire	5	4	5,320,322	4,273,697	D
Hibbing Police	4	5	4,656,504	3,237,558	C

COMMENT CODE:

- A - **Currently well-funded**; special assessment for MPRIF transfer unlikely for foreseeable future.
- B - **Significant** special assessment for MPRIF transfer within 5 years is possible but not highly probable.
- C - **Chance** of special assessment this year is small, but chance of special assessment within 5 years is significant.
- D - **Significant** chance that special assessment for MPRIF transfer may be needed **this year**.

*Combined rating for both police and fire (fire alone would be D, police alone would be A).

TABLE I-D: PERA CONSOLIDATION ACCOUNTS SUFFICIENCY FOR MPRIF TRANSFERS

Consolidation Account	# Eligible to Retire Now	Add'l # Eligible Within 5 Years	Current Assets	MPRIF Reserve	Comment Code
Mankato Fire	2	1	$ 7,034,392	$ 6,785,599	D
New Ulm Police	5	0	4,091,830	1,591,461	A
Red Wing Fire	4	1	5,926,268	2,225,081	A
Red Wing Police	3	3	7,831,131	249,144	A
Richfield Police	2	8	11,992,673	4,082,898	A
Rochester Fire	16	11	23,775,286	2,550,421	A
Rochester Police	22	10	25,004,056	7,421,720	A
South St. Paul Fire	3	3	5,121,948	3,764,990	C
St. Cloud Fire	10	8	9,373,345	5,505,059	B
St. Louis Park Fire	4	6	9,833,472	1,111,164	A
St. Louis Park Police	9	10	17,691,143	7,434,671	A
St. Paul Fire	78	68	137,307,745	86,717,040	A
St. Paul Police	104	127	167,922,306	84,167,489	A
West St. Paul Fire	6	3	6,622,150	1,951,092	A
West St. Paul Police	5	3	6,636,246	2,181,137	A
Winona Fire	1	3	9,116,029	8,346,278	C
Winona Police	7	5	7,704,025	5,500,381	B

COMMENT CODE:

A - **Currently well-funded**; special assessment for MPRIF transfer unlikely for foreseeable future.

B - **Significant** special assessment for MPRIF transfer within 5 years is possible but not highly probable.

C - **Chance** of special assessment this year is small, but chance of special assessment within 5 years is significant.

D - **Significant** chance that special assessment for MPRIF transfer may be needed **this year**.

II. PLAN PROVISIONS

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

For the July 1, 1994 Actuarial Valuation, we highlight the following:

Public Employees (Chapter 353): None.

Police and Fire (Chapter 353): None.

Police and Fire Consolidation: Added ten new accounts:

- Albert Lea Fire
- Austin Police
- Bloomington Police
- Columbia Heights Fire
- Columbia Heights Police
- Fridley Police
- New Ulm Police
- St. Paul Police
- South St. Paul Fire
- West St. Paul Police

The increase in the benefit accrual factor from 2.5% to 2.65% implemented in 1993 is not to be effective until each respective municipality approved the increase. All new accounts, including the ten listed above come in at 2.65%. As of July 1, 1994, the following additional municipalities had taken formal additional action to approve the change in the benefit accrual factor and our valuation reflects continuation of the 2.5% multiplier for all of the other groups:

- Albert Lea Police
- Crystal Police
- Duluth Fire
- Duluth Police
- Red Wing Fire
- Richfield Police
- Rochester Fire
- Rochester Police
- St. Cloud Fire
- St. Louis Park Fire
- St. Louis Park Police
- St. Paul Fire
- West St. Paul Fire

State Patrol (Chapter 352B): The annual six percent benefit increase for pre-1973 annuitants ended with all prior increases included in the annuity eligible for MPRIF increases.

Correctional Employees (Chapter 352): None.

Legislators (Chapter 3A): None.

Elective State Officers (Chapter 352C): None.

Judges (Chapter 490): None.

Teachers Retirement Association (Chapter 354): Benefit accrual rates were increased by .13% and member contribution rates were increased by 2% of payroll.

Duluth Teachers (Chapter 354A): None.

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

Minneapolis Teachers (Chapter 354A): Effective July 1, 1995, the post-retirement benefit increase will equal two percent plus an additional amount calculated as the product of one minus the rate of contribution sufficiency for the fund and the excess of the five-year time weighted total rate of return over the assumed preretirement interest rate.

Effective July 1, 1994, the employer contribution rate for Basic Members decreased from 13.35% of salary to 12.14% of salary. The employer contribution rate for Coordinated Members increased from 5.00% of salary for the plan year ending June 30, 1994 to 8.14% of salary thereafter.

Effective the day following receipt of contributions from School District Number 1, the City of Minneapolis and Matching State Contributions, Members are required to reimburse the fund for the excess of prior year administrative expenses as a percentage of payroll over prior year administrative expenses as a percent of payroll for the Teachers' Retirement Association ("TRA").

Minneapolis Employees (Chapter 422A): None.

III. ACTUARIAL ASSUMPTIONS (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 which 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 of 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, 1994 Actuarial Valuation for that Fund. It is anticipated that these assumptions for the major plans will be reviewed every four years via a formal experience study. Such an experience study was completed during the 1992-93 contract year. The results of this study have resulted in a change in many significant assumptions for the July 1, 1994 valuation of the three major statewide plans. These changes have been summarized in the tables.

In our opinion, the assumptions used for the July 1, 1994 valuations are reasonable and well within the mainstream of current actuarial practice. Experience studies and assumption reviews are underway for most of the other plans which fall under the jurisdiction of the LCPR. We expect that these studies/reviews will result in recommended assumption changes for these plans. We intend for these recommendations to be similar in structure to those made for the three major statewide plans, but still remaining plan specific. A complete set of recommendations will be made in time for adoption by the LCPR for use in the July 1, 1995 actuarial valuation work.

TABLE III-A: JULY 1, 1994 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%/5.0%	*/Prior Year Salary Increased	N/A	3.5% Implied by 5.0% Interest Rate
Police and Fire (Chapter 353)	8.5%/5.0%	6.5% Prior Year Salary Increased	N/A	3.5% Implied by 5.0% Interest Rate
Police and Fire Consolidation	8.5%/5.0% (PERA) 8.5% (Local)	6.5%/Prior Year Salary Increased	N/A	3.5% Implied (PERA) 6.5% Explicit (Local)
State Employees (Chapter 352)	8.5%/5.0%	*/Reported Salary Increased	N/A	3.5% Implied by 5.0% Interest Rate
State Patrol (Chapter 352B)	8.5%/5.0%	6.5%/Reported Salary Increased	N/A	3.5% Implied by 5.0% Interest Rate
Correctional (Chapter 352)	8.5%/5.0%	6.5%/Reported Salary Increased	Current Law and 6.5% Salary Scale	3.5% Implied by 5.0% Interest Rate
Legislators (Chapter 3A)	8.5%/5.0%	Statutory Salary, then 6.5%	N/A	3.5% Implied by 5.0% Interest Rate
Elective State Officers (Chapter 352C)	8.5%/5.0%	Statutory Salary, then 6.5%	N/A	3.5% Implied by 5.0% Interest Rate
Judges (Chapter 490)	8.5%/5.0%	Statutory Salary, then 6.5%	N/A	3.5% Implied by 5.0% Interest Rate
Teachers (Chapter 354)	8.5%/5.0%	*/Reported Salary Increased	N/A	3.5% Implied by 5.0% Interest Rate
Duluth Teachers (Chapter 354A)	8.5%/8.5%	6.5%/Reported Salary Increased	N/A	Bonus of 1% Charged to Interest Rate
St. Paul Teachers (Chapter 354A)	8.5%/8.5%	6.5%/Reported Salary Increased	N/A	Bonus of 1% Charged to Interest Rate
Minneapolis Teachers (Chapter 354A)	8.5%/8.5%	6.5%/Reported Salary Increased	N/A	2% Per Annum
Minneapolis Employees (Chapter 422A)	6.0%/5.0%	4.0%/Reported Pay Increased 1.018%	N/A	3.5% Implied by 5.0% Interest Rate

TABLE III-B: JULY 1, 1994 ACTUARIAL ASSUMPTIONS - CATEGORY 2

(Highlighted box indicates change from prior year)

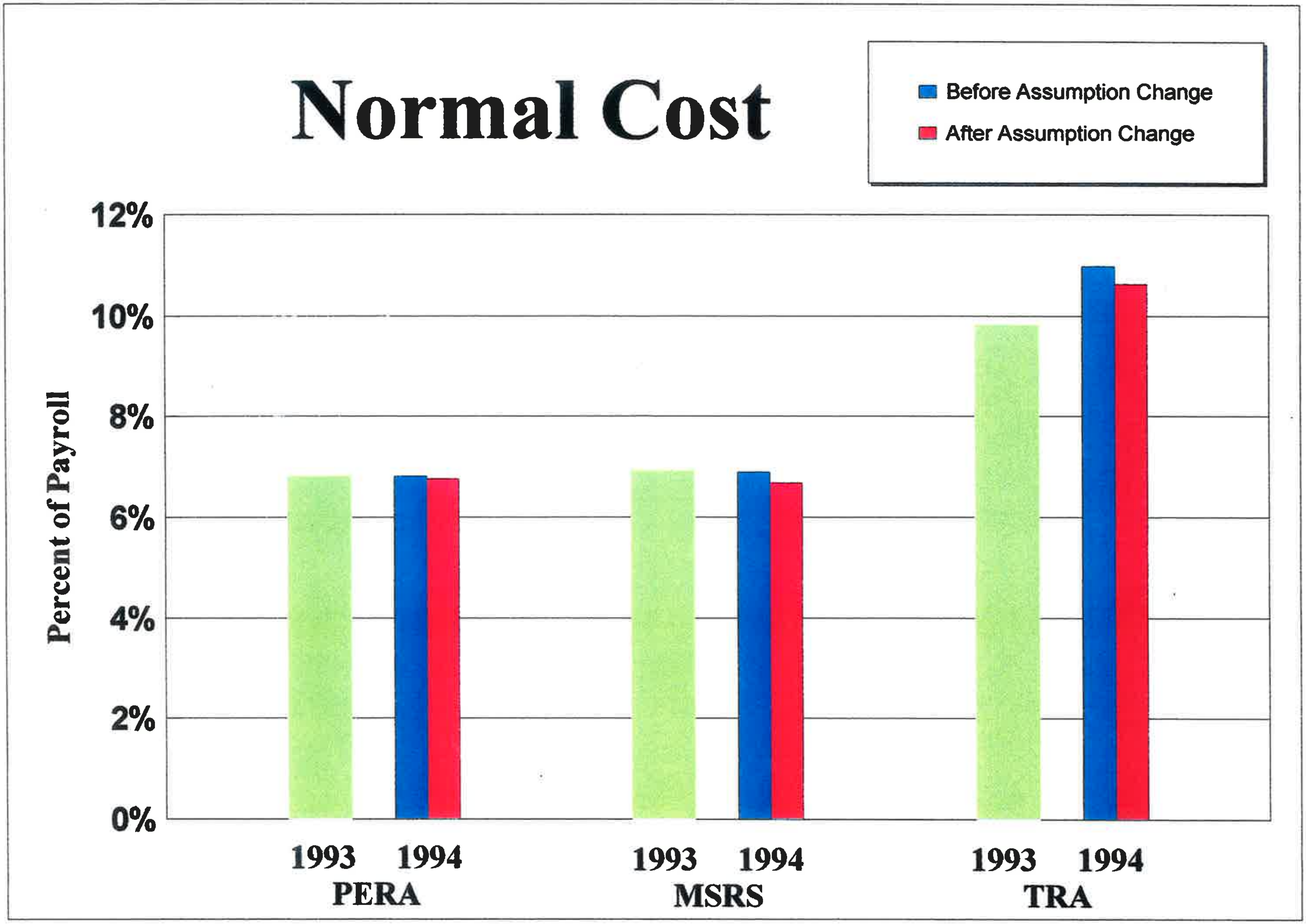
Fund	Mortality Table (male rates shown)	Disability Table (male rates shown)	Retirement Age (Coordinated)	Other Separation (male rates shown)
Public Employees (Chapter 353)	1983 GAM* Male set back 5 years	Graded: .12% @ 35 .58% @ 55	Age 64 and 50% of Rule of 90 (first year only)	Graded: 7.19% @ 35 1.95% @ 55
Police and Fire (Chapter 353)	1971 GAM projected to 1984 by Scale D*	Graded: .19% @ 35 1.35% @ 55	Age 60	Graded: 1.83% @ 35 .11% @ 55
Police and Fire Consolidation	1971 GAM projected to 1984 by Scale D*	Graded: .19% @ 35 1.35% @ 55	Varies between ages 50-60	Graded: 1.83% @ 35 .11% @ 55
State Employees (Chapter 352)	1983 GAM* Male set back 4 years	Graded: .02% @ 35 .34% @ 55	Graded from age 58 and 25% of Rule of 90	Graded: 7.20% @ 35 2.10% @ 55
State Patrol (Chapter 352B)	1971 GAM*	Graded: .11% @ 35 .88% @ 55	Age 58 (age 63 if hired prior to 1961)	Graded: 1.50% @ 35 0.00% @ 55
Correctional (Chapter 352)	1971 GAM*	Graded: .02% @ 35 .34% @ 55	Age 58	Graded: 7.20% @ 35 2.10 @ 55
Legislators (Chapter 3A)	1971 GAM	None	Age 62	Varies based upon service; 0% @ 9 years
Elective State Officers (Chapter 352C)	1971 GAM	None	Age 62	Varies based upon service; 0% @ 9 years
Judges (Chapter 490)	1971 GAM	Graded: .02% @ 35 .34% @ 55	Age 68	None
Teachers (Chapter 354)	1983 GAM* Male set back 8 years	Graded: .06% @ 35 .36% @ 55	Age 62 and 30% of Rule of 90	Select & ultimate graded
Duluth Teachers (Chapter 354A)	1971 GAM set back 8 years	Graded: .29% @ 35 .87% @ 55	Age 61 Old Plan Age 63 New Plan 30% Under Rule of 90	Graded: 4.91% @ 35 .13% @ 55
St. Paul Teachers (Chapter 354A)	1971 GAM set back 8 years	Graded: .10% @ 35 .40% @ 55	Age 62 With 30 Years and 30% of Rule of 90	Graded: 4.5% @ 35 1.0% @ 55
Minneapolis Teachers (Chapter 354A)	1971 GAM set back 8 years	Graded: .05% @ 35 .36% @ 55	Age 63 (60 for Basic) and 30% of Rule of 90	Graded: 4.50% @ 35 0.50% @ 55
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

*Except post-disability.

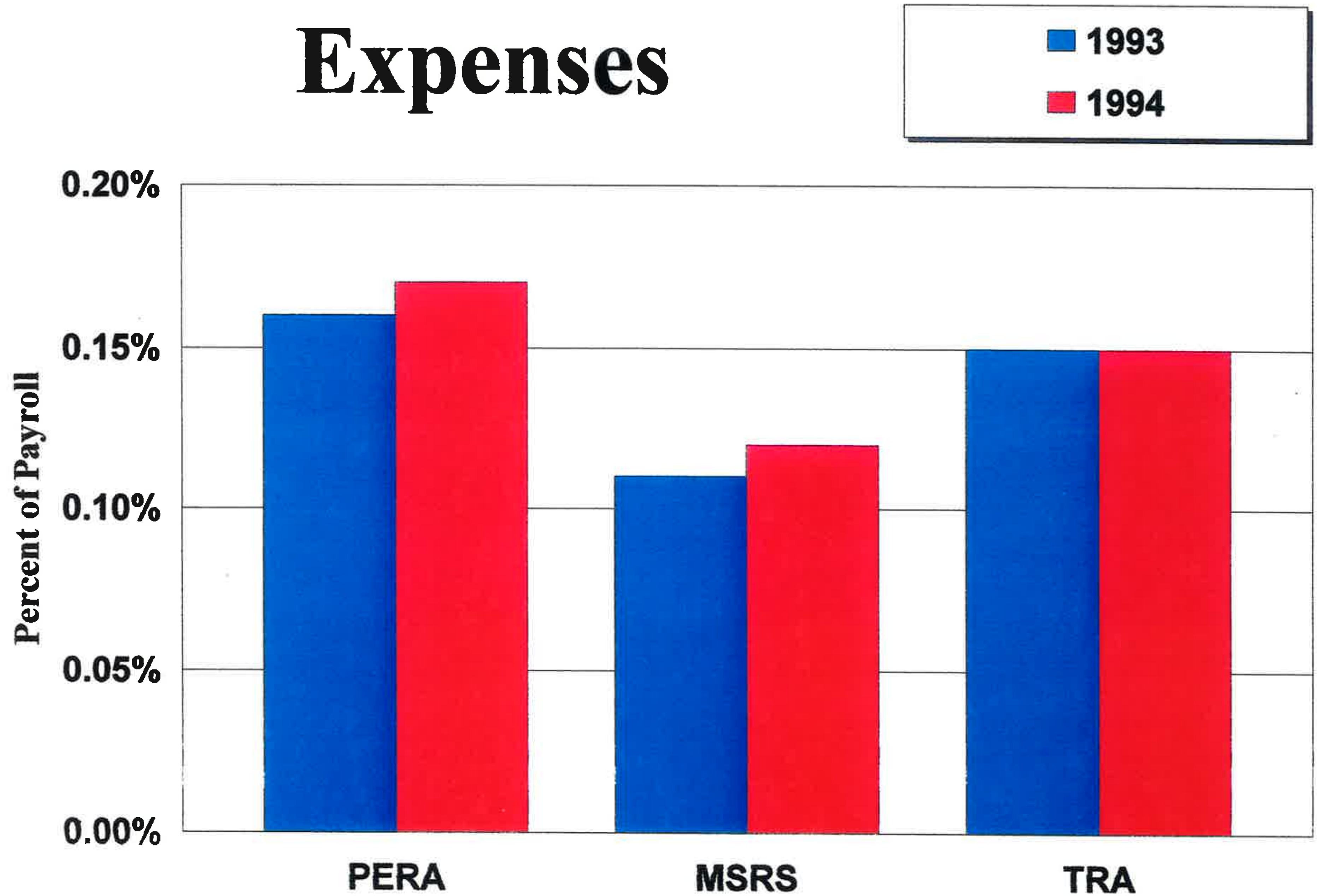
TABLE III-C: JULY 1, 1994 ACTUARIAL ASSUMPTIONS - CATEGORY 3

(Highlighted box indicates change from prior year)

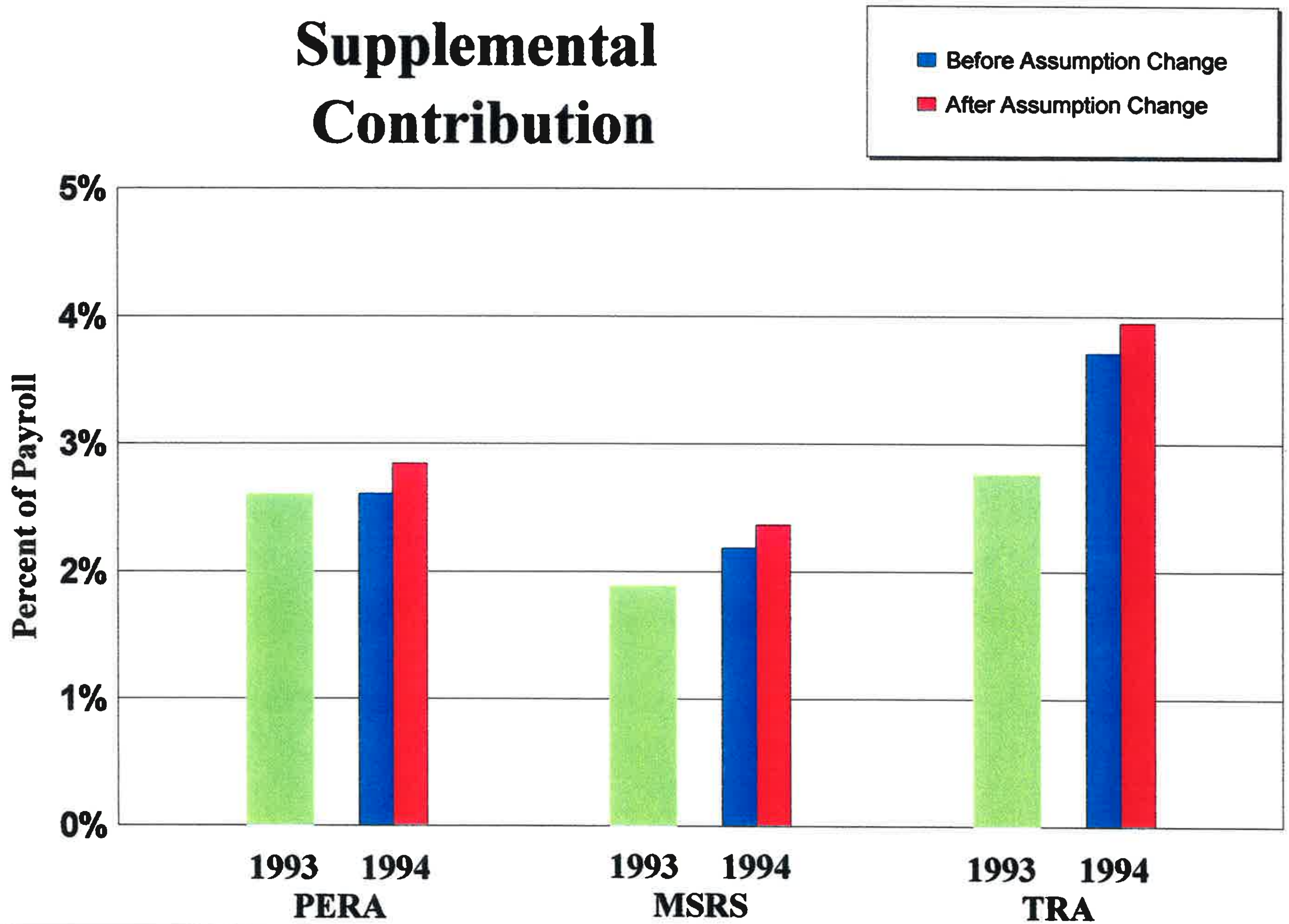
Fund	Family Composition (Male/Female)	Expenses (Admin. Only)	Bounceback Annuity Election (Male/Female)	Other
Public Employees (Chapter 353)	85%/65% married; no children	Prior year as % of payroll	30%/15% for 50% J&S 45%/15% for 100% J&S	None
Police and Fire (Chapter 353)	85%/65% married; no children	Prior year as % of payroll	40%/15% for 50% J&S 45%/15% for 100% J&S	None
Police and Fire Consolidation	85%/65% married; no children	Expenses paid outside the fund	40%/15% for 50% J&S 45%/15% for 100% J&S	None
State Employees (Chapter 352)	85%/85% married	Prior year as % of payroll	25%/ 5% for 50% J&S 45%/ 5% for 100% J&S	None
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	None
Correctional (Chapter 352)	85%/85% married	Prior year as % of payroll	25%/ 5% for 50% J&S 25%/ 5% for 100% J&S	None
Legislators (Chapter 3A)	85%/85% married; two children	Prior year as % of payroll	None	$4,800 per diem income
Elective State Officers (Chapter 352C)	85%/85% married; two children	Prior year as % of payroll	None	No refunds after 8 years
Judges (Chapter 490)	Actual data	Prior year as % of payroll	None	No refunds
Teachers (Chapter 354)	85%/65% married; no children	Prior year as % of payroll	15%/10% for 50% J&S 50%/10% for 100% J&S	None
Duluth Teachers (Chapter 354A)	80%/80% married	Prior year as % of payroll	40%/10% for 50% J&S 40%/10% for 100% J&S	None
St. Paul Teachers (Chapter 354A)	85%/60% married; two children	Prior year as % of payroll	15%/10% for 50% J&S 50%/10% for 100% J&S	3% increase on State contributions
Minneapolis Teachers (Chapter 354A)	80%/60% married	Prior years as % of payroll	15%/10% for 50% J&S 50%/10% for 100% J&S	Benefit increase = (5 yr. return - 8.50%) x (1 - contribution deficiency)
Minneapolis Employees (Chapter 422A)	67%/67% married	Prior year increased by 4% as % of payroll	None	Investment expense amortized to a required date


Normal Cost
Before Assumption Change
After Assumption Change
Percent of Payroll
12%
10%
8%
6%
4%
2%
0%
1993
1994
PERA
1993
1994
MSRS
1993
1994
TRA

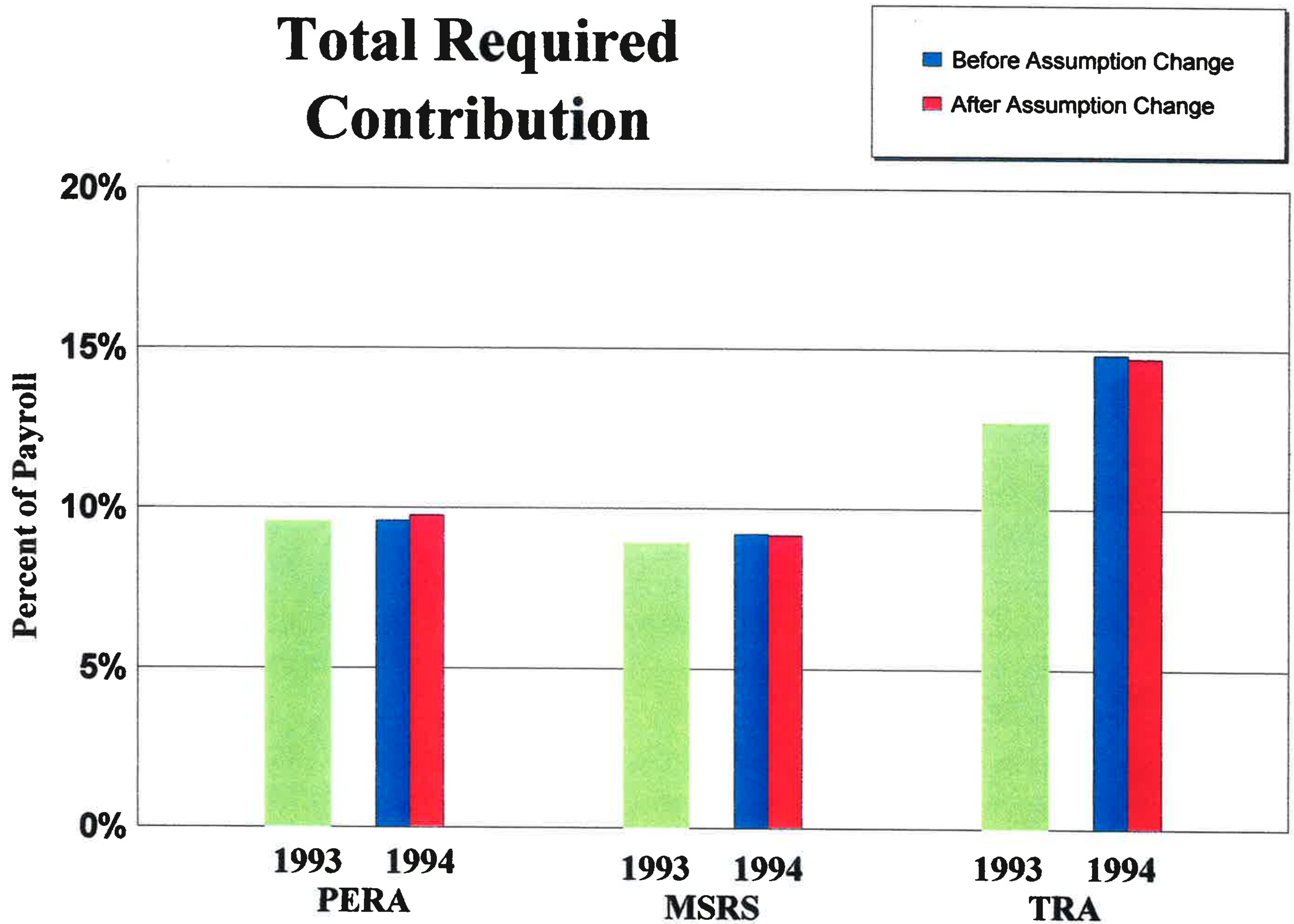
Expenses


1993
1994
0.20%
0.15%
0.10%
0.05%
0.00%
Percent of Payroll
PERA
MSRS
TRA

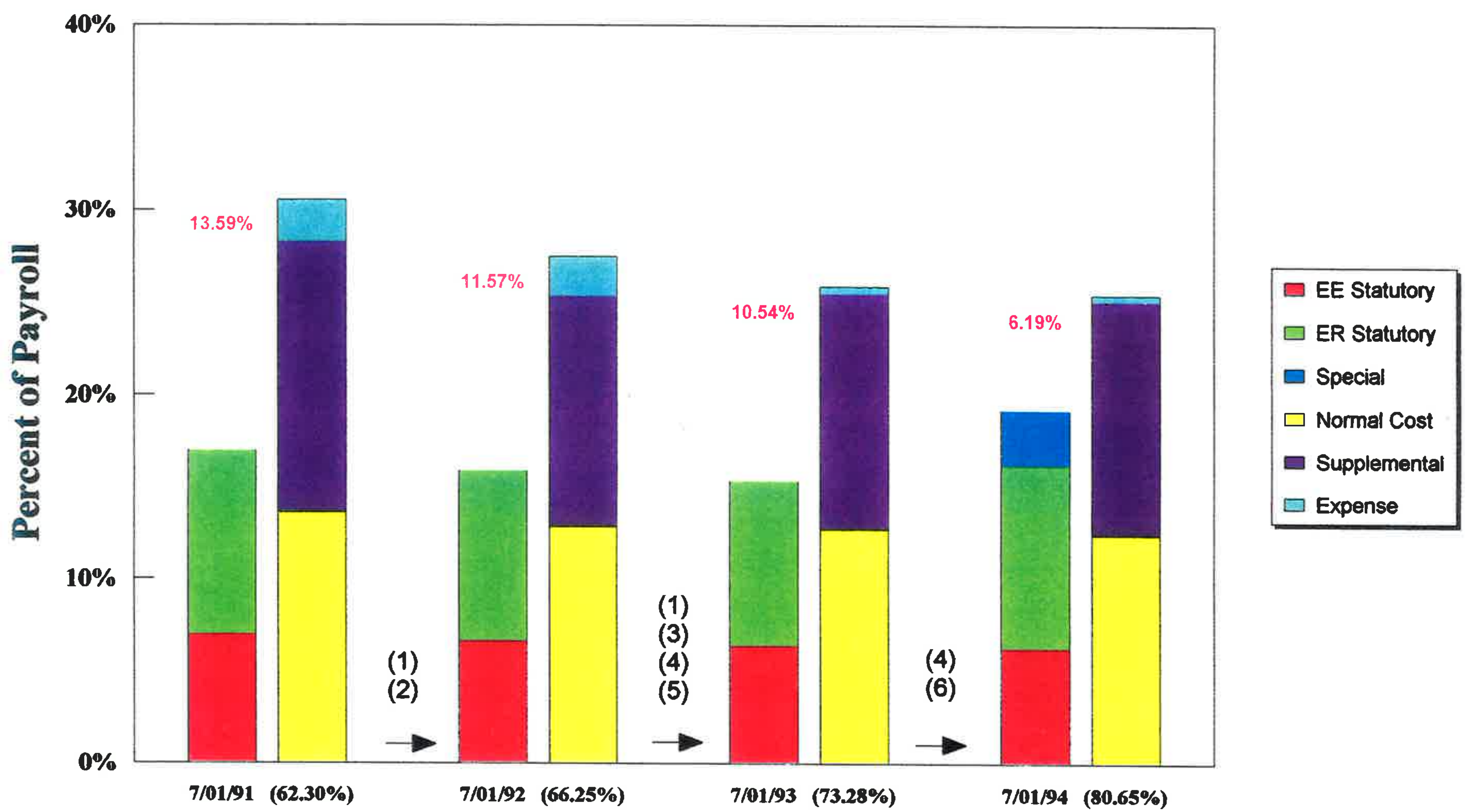
Supplemental Contribution



Total Required Contribution



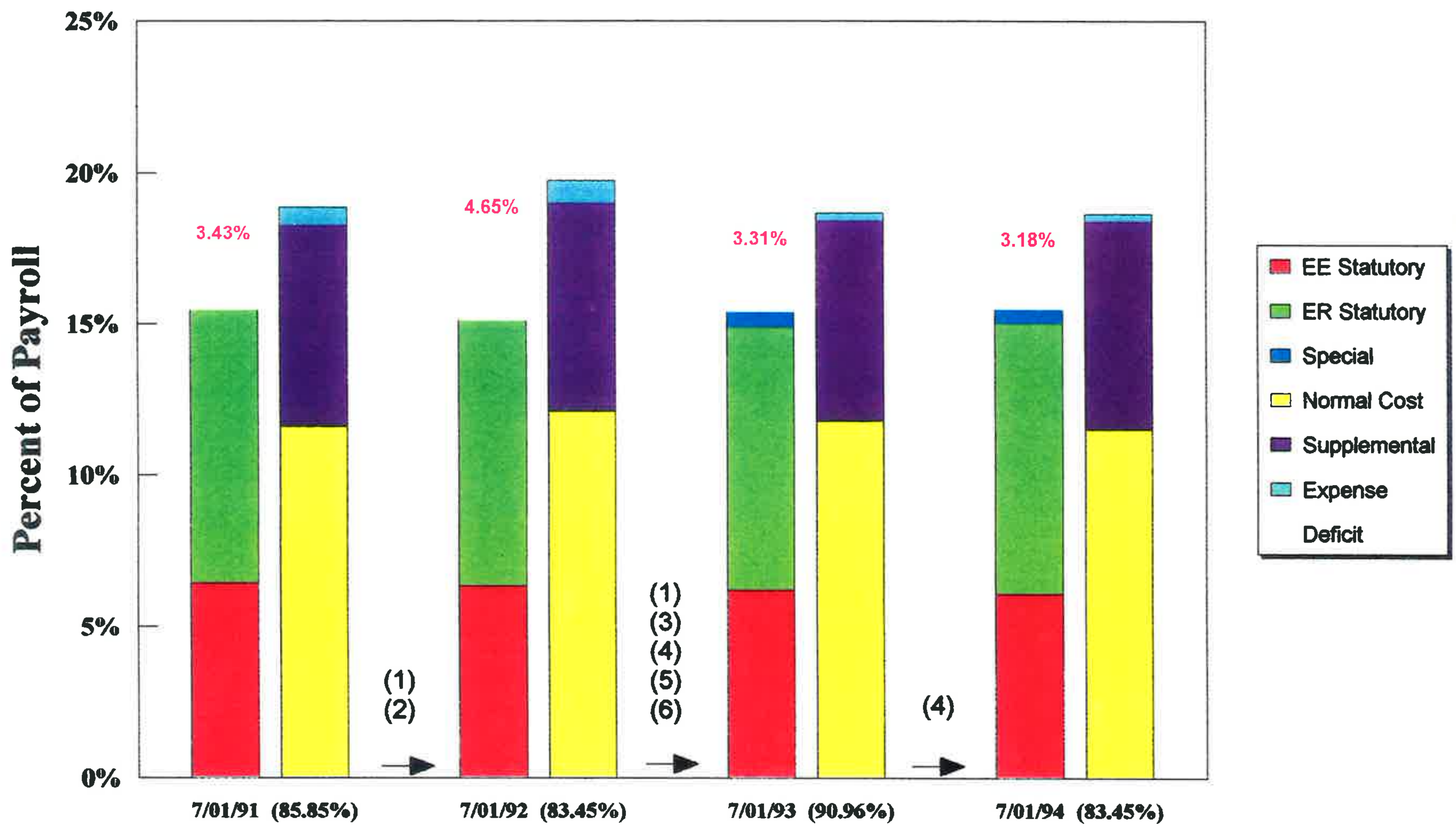
MINNEAPOLIS TEACHERS' RETIREMENT FUND



Footnotes:

(1) Favorable Experience
(2) Change in Methods and Assumptions
(3) Early Retirement Incentive Program
(4) Increase in Employer Statutory Rates
(5) Change in Treatment of Investment Expenses
(6) Addition of $5,000,000 Special Contribution

ST. PAUL TEACHERS' RETIREMENT FUND



Footnotes:

(1) Favorable Experience
(2) Change in Methods, Assumptions, and recognition of certain ben
(3) Early Retirement Incentive Program
(4) Increase in Employer Statutory Rates
(5) Change in Treatment of Investment Expenses
(6) Addition of Special State Contribution