STATE OF MINNESOTA

SUMMARY OF 1993 ACTUARIAL VALUATIONS

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Minnesota Legislative Commission
on Pensions and Retirement
55 State Office Building
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ATTENTION: Mr. Lawrence A. Martin

Commission Members:

We have completed all of the July 1, 1993 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 1993-94 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,

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I. 1993-94 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. Please note that each plan was impacted by a change in the treatment of expenses. Administrative expenses will continue to be an additional funding requirement while investment expenses will now be viewed as a component of net investment income. This statutory change in the treatment of investment expenses is commensurate to an increase in the assumed investment return used to determine funding requirements.

PERA

1. The Public Employees plan showed a modest deficiency for 1992. This deficiency decreased in 1993 mainly due to significant investment gains, salary increases less than assumed, and an assumption change with respect to expenses. These gains were modestly offset by death benefit improvements and an early retirement window. Funding ratios have increased for current accruals of benefits and projected benefit funding. Total active membership increased by about 5%.

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. We note that a legislative change to amortize the overfunded accrued liability, coupled with significant gains, improved the contribution sufficiency despite the lower projected funding ratio due to increased benefits.

3. The Police and Fire Consolidation plan requires substantial contribution levels. Since the statutes require full current funding, no deficiency is noted but the required rate is currently over 40% 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 80%. Three 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 contribution deficiency due to an adjustment in the valuation methodology used for Rule of 90 decrements. The funding ratios dropped slightly from the prior year. The plan experienced investment and salary related gains and had benefit improvements in death benefits and coverage as well as an early retirement incentive.

5. The State Patrol plan shows a contribution sufficiency which is higher than last year primarily due to the methodology change for expenses. General accrued benefit funding ratios are slightly less than last year but still good while the projected benefit funding ratio improved.

6. The State Correctional Employees plan continues to be well-funded on a current benefit ratio basis and the required actuarial funding is also sufficient due to the methodology change for expenses and actuarial gains. This plan also had improvements for death benefits and coverage.

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 3 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 decreased due to significant actuarial gains and the sufficiency of the statutory contribution. 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 a decrease in its contribution deficiency due mainly to significant actuarial gains and the treatment of expenses. The accrued benefit funding ratios showed substantial improvement over the prior year as well. The plan had benefit improvements in death benefits and coverage as well as an early retirement incentive.

10. The Duluth Teachers plan has a contribution sufficiency of .08% this year compared to a deficiency of 1.13% of payroll last year. This plan experienced actuarial gains in the prior year which resulted in improved accrued benefit funding ratios as well. The change in methodology for expenses has increased the funding sufficiency also. The plan had benefit improvements in death benefits and coverage as well as an early retirement incentive.

11. The St. Paul Teachers plan contribution deficiency has significantly improved since the last valuation. Most of this improvement is attributable to increased contributions, the methodology change for expense allowance and significant actuarial gains. At 3.31% of payroll, however, the size of this deficiency still warrants attention. While new contribution rates have taken effect on July 1, 1993, it appears that further increases in funding rates will be necessary. The plan had benefit improvements in death benefits and coverage as well as an early retirement incentive.

12. The Minneapolis Teachers plan showed noticeable improvement in the contribution deficiency from last year. This improvement was due to the methodology change for expense allowance, actuarial gains in 1992-93, and the legislated increase in statutory contributions. Even assuming maximum discretionary and matching contributions from the City of Minneapolis, the Minneapolis School District and the State of Minnesota, the deficiency is 6.80% of payroll. **This deficiency remains a serious problem requiring further corrective action.** Accrued funding ratios continue to show improvement, but are still very low. The plan had benefit improvements in death benefits and coverage as well as an early retirement incentive.

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 decreased slightly from the prior valuation due primarily to actuarial gains. Accrued funding ratios improved marginally from the prior valuation.

* * * *

With the exception of the MTRFA and St.PTRFA plans, the Minnesota retirement plans remain in relatively close actuarial balance. Based upon the results of our recent experience study, substantive revisions in current assumptions will be recommended. The sufficiency (deficiency) status of the respective plans is likely to be materially affected. Meanwhile, we do not believe any adjustment to current statutory contribution rates is warranted for plans other than MTRFA and St.PTRFA.

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.

- Readdress the severe 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

1993-94 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)	6.82%	2.60%	0.16%	9.58%	4.36%	4.68%	9.04%	(0.54)%
Police and Fire (Chapter 353)	19.26	(1.92)	0.11	17.45	7.80	11.70	19.50	2.05
Police and Fire Consolidation	20.21	23.61*	0.00	43.82	7.80	36.02	43.82	0.00
State Employees (Chapter 352)	6.93	1.89	0.11	8.93	4.07	4.20	8.27	(0.66)
State Patrol (Chapter 352B)	20.12	1.66	0.16	21.94	8.50	14.88	23.38	1.44
Correctional (Chapter 352)	10.82	0.00	0.15	10.97	4.90	6.27	11.17	0.20
Legislators (Chapter 3A)	17.71	13.05	0.36	31.12	9.00	Terminal Funding	N/A	N/A
Elective State Officers (Chapter 352C)	14.73	23.48	0.43	38.64	9.00	Pay-as-you-go Funding	N/A	N/A
Judges (Chapter 490)	16.67	9.45	0.17	26.29	6.36	22.00	28.36	2.07
Teachers (Chapter 354)	9.84	2.76	0.15	12.75	4.52	8.16	12.68	(0.07)
Duluth Teachers (Chapter 354A)	9.17	0.21	0.83	10.21	4.50	5.79	10.29	0.08
St. Paul Teachers (Chapter 354A)	11.78	6.63	0.27	18.68	6.31	9.06**	15.37	(3.31)
Minneapolis Teachers (Chapter 354A)	12.66	12.74	0.43	25.83	6.38***	8.91***	15.29***	(10.54)***
Minneapolis Employees (Chapter 422A)	18.68	23.49	2.20	44.37	9.75	34.62**	44.37	0.00

*Equal to the total statutory requirement less the normal cost.
**Includes State contributions of 0.38% for St. Paul Teachers and 11.72% for Minneapolis Employees.
***Do not reflect special contributions/assessments legislated last session but not approved as of the valuation date; with full implementation of special contributions/assessments, these numbers would change to 6.65%, 12.48%, 19.03% and (6.80)% respectively.

TABLE I-B

PATTERN OF SUFFICIENCY (DEFICIENCY): 1991-1993

Fund	Actuarial Requirements			Statutory Requirements			Sufficiency (Deficiency)		
	1991	1992	1993	1991	1992	1993	1991	1992	1993
Public Employees	9.44%	9.95%(2)	9.58%(2)	9.17%	9.10%	9.04%	(0.27)%	(0.85)%	(0.54)%
Police & Fire	17.54	18.05(2)	17.45(1),(2)	20.00	20.00	19.50(3)	2.46	1.40	2.05
Police & Fire Consolidation	56.14	54.55(2)	43.82	56.14	54.55	43.82	0.00	0.00	0.00
State Employees	7.86	8.27(2)	8.93(1),(2)	8.44	8.11(3)	8.27(3)	0.58	(0.16)	(0.66)
State Patrol	22.58	22.27(2)	21.94(2)	23.38	23.38	23.38	0.80	1.11	1.44
Correctional	10.82	11.41(2)	10.97(2)	11.17	11.17	11.17	0.35	(0.24)	0.20
Legislators	27.67	30.49(2)	31.12(2)	T.F.	T.F.	T.F.	N/A	N/A	N/A
Elective State Officers	33.28	36.23(2)	38.64(2)	P.A.Y.G.	P.A.Y.G.	P.A.Y.G.	N/A	N/A	N/A
Judges	25.10	26.59(2)	26.29(2)	26.34(3)	28.38	28.36	1.24	1.79	2.07
Teachers	13.04	13.13(2)	12.75(2)	12.76	12.72	12.68	(0.28)	(0.41)	(0.07)
Duluth Teachers	11.09	11.42(2)	10.21(2)	10.29	10.29	10.29	(0.80)	(1.13)	0.08
St. Paul Teachers	18.87	19.74(1),(2)	18.68(2)	15.44	15.09	15.37(3)	(3.43)	(4.65)	(3.31)
Minneapolis Teachers	30.55	27.43(2)	25.83(2)	16.96	15.86	15.29	(13.59)	(11.57)	(10.54)(4)
Minneapolis Employees	43.78(2)	44.57(2)	44.37(2)	43.78	44.57	44.37	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: 1991-1993
(DOLLARS IN MILLIONS)

Fund	Current Assets			P.V. of Accrued Benefit			A.B. Funding Ratio		
	1991	1992	1993	1991	1992	1993	1991	1992	1993
Public Employees	$3,570	$3,978	$4,374	$4,458	$4,868	$5,164	80.09%	81.72%	84.71%
Police & Fire	840	980	1,118	733	822	932(1)	114.55	119.28	119.95(1)
Police & Fire Consolidation	143	178	357	209	223	433	68.59	79.90	82.41
State Employees	2,304	2,613	2,906	2,520	2,745	3,057	91.44	95.21	95.02
State Patrol	200	222	244	215	224	247	93.22	99.04	98.68
Correctional	106	121	136	95	106	116	111.39	114.63	117.30
Legislators	15	15	17	30	32	35	49.57	46.97	49.06
Elective State Officers	0.3	0.3	0.3	2.2	2.3	2.5	14.25	14.72	12.64
Judges	34	38	44	76	81	87	44.00	46.54	50.50
Teachers	5,615	6,325	7,046	6,537	6,997	7,608	85.89	90.40	92.62
Duluth Teachers	105	116	131	109	116	125	96.35	100.71	105.04
St. Paul Teachers	326	356	393	466	503(1),(2)	539	70.04	70.77	72.91
Minneapolis Teachers	425	458	502	780	795(2)	836	54.48	57.60	60.02
Minneapolis Employees	824(3)	838	889	1,080(2)	1,092	1,135	76.26	76.78	78.30

(1) Substantive benefit change implemented.
(2) Assumption or methodology change implemented.
(3) Unusual asset experience.

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 Police	3	6	$ 8,278,462	$ 2,893,946	A
Anoka Police	2	0	2,555,651	1,743,259	B
Buhl Police	0	0	989,942	819,525	A
Chisholm Fire	2	0	1,467,400	1,386,060	D
Chisholm Police	1	0	1,009,121	936,589	D
Crookston Fire	3	3	1,014,314	351,788	C
Crystal Police	4	2	7,665,763	2,854,277	A
Duluth Fire	29	29	23,794,522	22,648,826	B*
Duluth Police	15	24	33,898,289	22,675,899	B*
Faribault Fire	4	1	4,071,734	3,058,353	C
Hibbing Fire	6	3	4,858,410	4,033,480	D
Hibbing Police	4	6	4,256,635	3,631,179	D
Mankato Fire	5	1	5,821,843	5,905,986	D
Red Wing Fire	5	1	5,765,426	1,863,206	A
Red Wing Police	3	2	7,428,643	242,263	A
Richfield Police	1	10	11,477,464	3,945,353	A
Rochester Fire	15	13	22,538,751	1,282,901	A
Rochester Police	21	13	23,402,515	6,423,879	A
St. Cloud Fire	9	8	8,687,416	5,346,022	B
St. Louis Park Fire	4	5	9,323,637	1,075,241	A
St. Louis Park Police	7	13	16,762,951	6,497,497	A
St. Paul Fire	84	64	129,870,545	80,572,078	A
W. St. Paul Fire	6	3	6,277,463	1,835,827	A
Winona Fire	6	3	8,754,558	6,362,373	B
Winona Police	8	7	7,188,530	4,789,691	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**.

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

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, 1993 Actuarial Valuation, we highlight the following:

Public Employees (Chapter 353): Increased amount and coverage for death benefits prior to age 50 for active Members. Also, a temporary early retirement window providing enhanced benefits was effective between May 1993 and January 1994.

Police and Fire (Chapter 353): Contributions were decreased from 8% and 12% to 7.6% and 11.4% of salary for Members and Employer, respectively. This is subject to change depending upon future funding sufficiency/deficiency.

Retirement factor was increased from 2.5% to 2.65% for both retirement and disability.

Age restriction was removed for disability eligibility.

Member death while disabled prior to age 65 or within five years of the disability effective date allows surviving spouse the option of Survivor Annuity, regular death benefit or refund. Dependent children are also covered, same as Active Member death.

Police and Fire Consolidation: Added three new accounts:

- Crystal Police
- Duluth Fire
- St. Paul Fire

The benefit and contribution changes applicable to the Police and Fire plan described above generally apply to the Consolidation plan as well. However, the increase in the benefit accrual factor was not to be effective until each respective municipality approved the increase. As of July 1, 1993, the following municipality had taken formal 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

State Employees (Chapter 352): Increased amount and coverage for death benefits prior to age 50 for active Members. Also, a temporary early retirement window providing enhanced benefits was effective between May 1993 and January 1994.

State Patrol (Chapter 352B): Removed age 60 service cap retroactive to 1/1/88 and removed under age 55 restriction for disability eligibility.

Correctional Employees (Chapter 352): Increased amount and coverage for death benefits prior to age 50 for active Members and removed under age 55 eligibility requirement for disability benefits.

Legislators (Chapter 3A): None.

Elective State Officers (Chapter 352C): None.

Judges (Chapter 490): None.

Teachers Retirement Association (Chapter 354): Increased amount and coverage for death benefits prior to age 50 for active Members. Also, a temporary early retirement window providing enhanced benefits was effective between May 1993 and August 1993.

Duluth Teachers (Chapter 354A): Increased amount and coverage for death benefits prior to age 50 for active Members. Also, a temporary early retirement window providing enhanced benefits was effective between May 1993 and August 1993.

St. Paul Teachers (Chapter 354A): Effective July 1, 1994, the employer contribution rate for Coordinated Members will be increased from 5.00% of salary to 6.00% of salary. Subsequent years will be increased to 8.14% of salary. A State contribution of $500,000 per year (to be adjusted in the future in accordance with the State aid formula) was added, along with a special excess expense assessment charged to Members. The special additional employer contribution calculated to make up for the reduction experienced when a basic Member was replaced by a coordinated Member has been dropped. Increased amount and coverage for death benefits prior to age 50 for active Coordinated Members. Also, a temporary early retirement window providing enhanced benefits was effective between May 1993 and August 1993.

Minneapolis Teachers (Chapter 354A): Effective July 1, 1994, the employer contribution rate for Coordinated Members will be increased from 5.00% of salary to 8.14% of salary. The special additional employer contribution calculated to make up for the reduction experienced when a basic Member was replaced by a coordinated Member has been dropped. Additional "contingent" funding was legislated:

(1) The State of Minnesota would "match" the contributions under parts (2) and (3) below up to a maximum of $1,250,000 each;
(2) Special supplemental contribution from the City of Minneapolis (as approved by the City Council);
(3) Special supplemental contributions from the Minneapolis School District (as approved by the School Board); and
(4) Special "expense assessment" charged to Members.

Increased amount and coverage for death benefits prior to age 50 for active Coordinated Members. Also, a temporary early retirement window providing enhanced benefits was effective between May 1993 and August 1993.

Minneapolis Employees (Chapter 422A): An Early retirement Incentive providing enhanced benefits may be offered to eligible Members who retire between May 17, 1993 and January 31, 1994. Implementation of the Special Early Retirement Incentive is contingent upon adoption by individual employing units. As of July 1, 1993, none of the employing units had adopted these provisions.

The methodology to determine annual post-retirement benefit increases was modified in a manner similar to the statewide Minnesota Post-retirement Investment Fund.

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, 1993 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 are currently under review.

For the July 1, 1993 Actuarial Valuation, a change was made to the calculation of plan expense allowance for purposes of determining the required funding. This change provides for administrative expenses only to be used as the expense component for funding. The investment expense is now assumed to be a component of the net investment return. This change produced a result similar to that of an increase in the investment return assumption although the impact varied significantly from plan to plan.

In our opinion, the assumptions used for the July 1, 1993 valuations are reasonable and well within the mainstream of current actuarial practice. Until the review of the formal experience study results is completed, we have no recommendation concerning changes to the actuarial assumptions.

TABLE III-A

JULY 1, 1993 ACTUARIAL ASSUMPTIONS - CATEGORY 1

Fund	Interest Rates Pre-retire/Post-retire	Salary Increase %/Data Used	Social Security	COLA on Benefits
Public Employees (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 (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%	6.5%/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%	6.5%/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%/6.5%	6.5%/Reported Salary Increased	N/A	2% Implied by 6.5% Interest Rate
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, 1993 ACTUARIAL ASSUMPTIONS - CATEGORY 2

Fund	Mortality Table (male rates shown)	Disability Table (male rates shown)	Retirement Age (Coordinated)	Other Separation (male rates shown)
Public Employees (Chapter 353)	1971 GAM projected to 1984 by Scale D*	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)	1971 GAM*	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)	1971 GAM 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

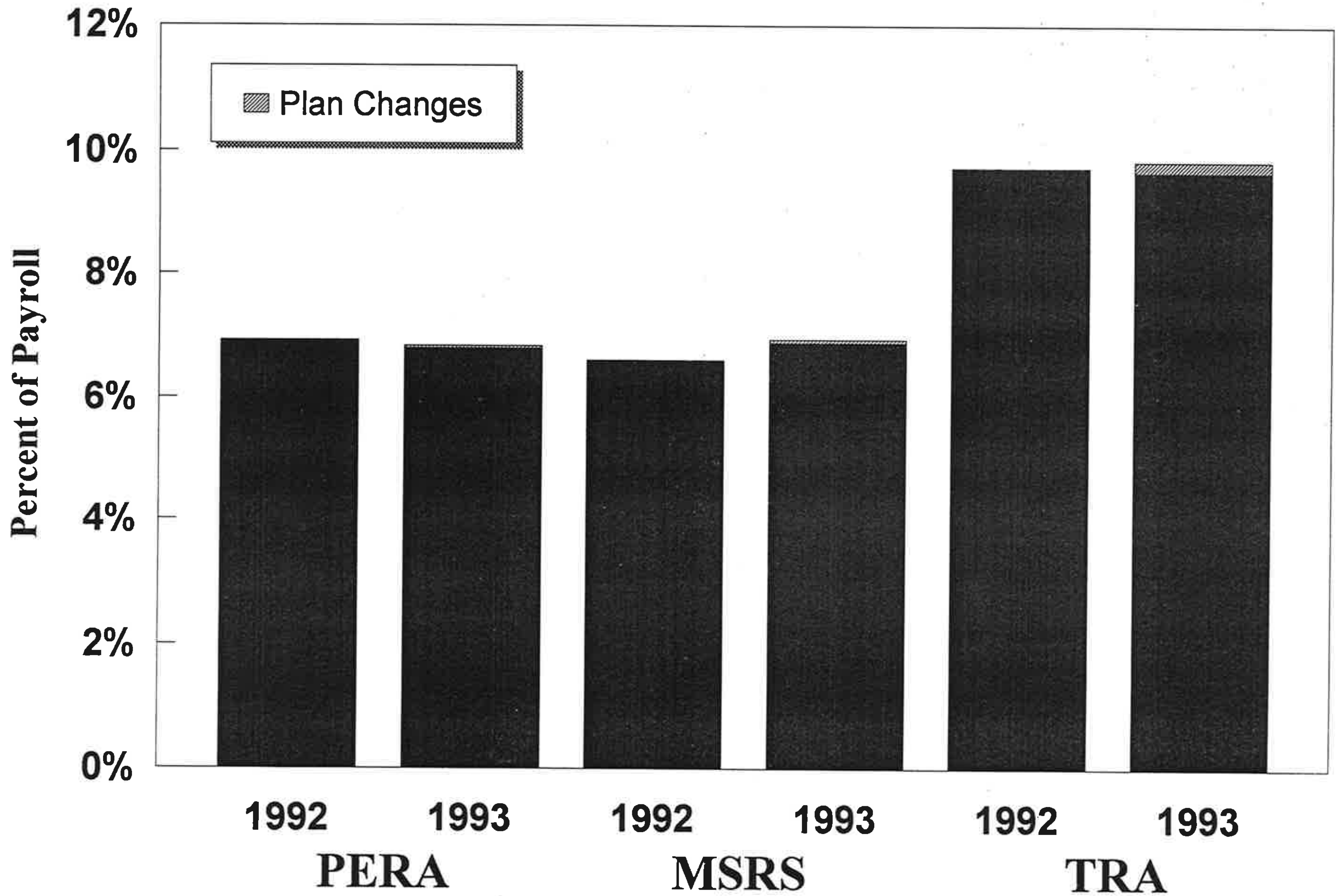
*Except post-disability.

TABLE III-C

JULY 1, 1993 ACTUARIAL ASSUMPTIONS - CATEGORY 3

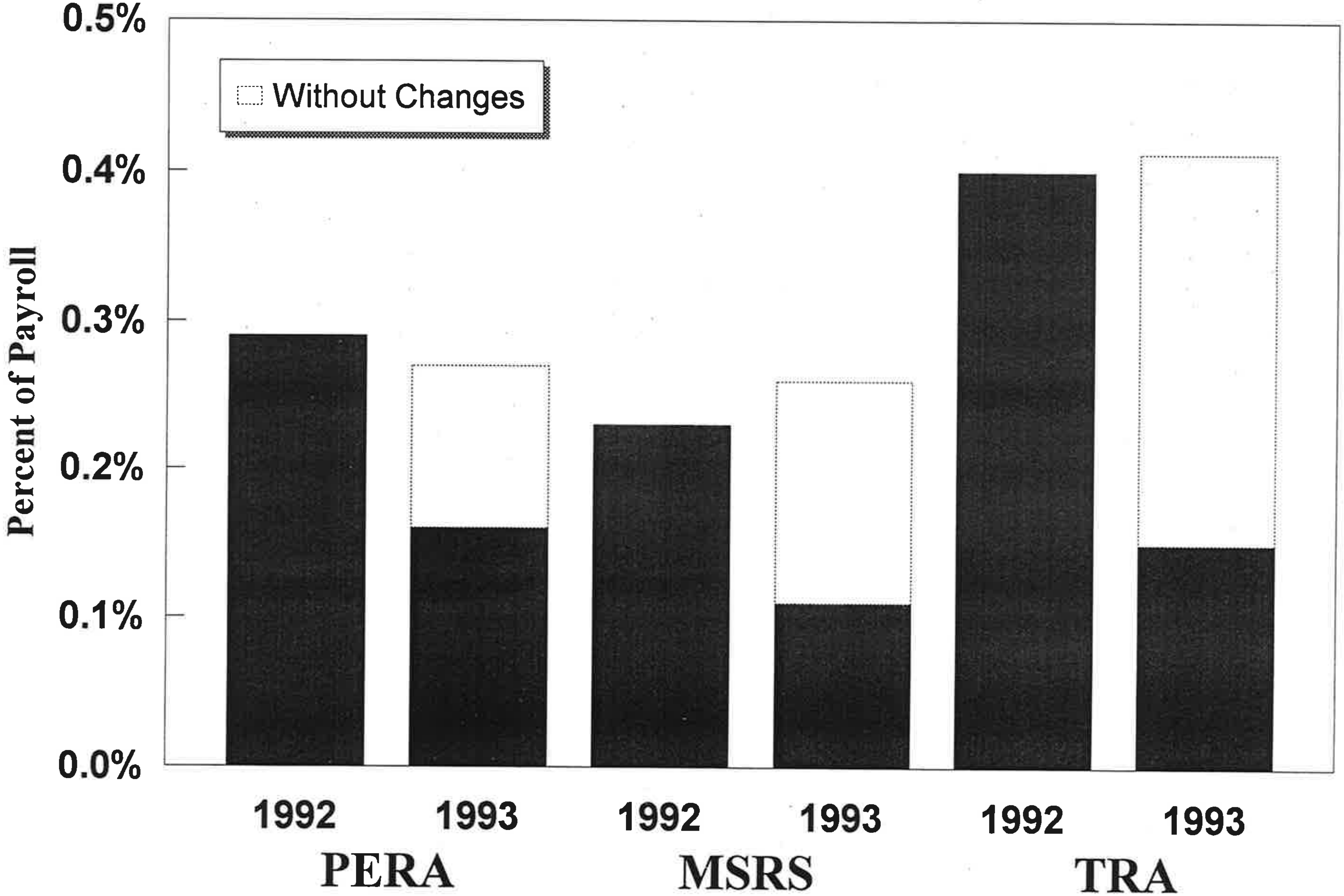
Fund	Family Composition (Male/Female)	Expenses (Admin. Only)	Bounceback Annuity Election (Male/Female)	Other
Public Employees (Chapter 353)	85%/65% married; no children	Prior year as % of payroll	30%/15% for 50% J&S 45%/15% for 100% J&S	None
Police and Fire (Chapter 353)	85%/65% married; no children	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	None
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



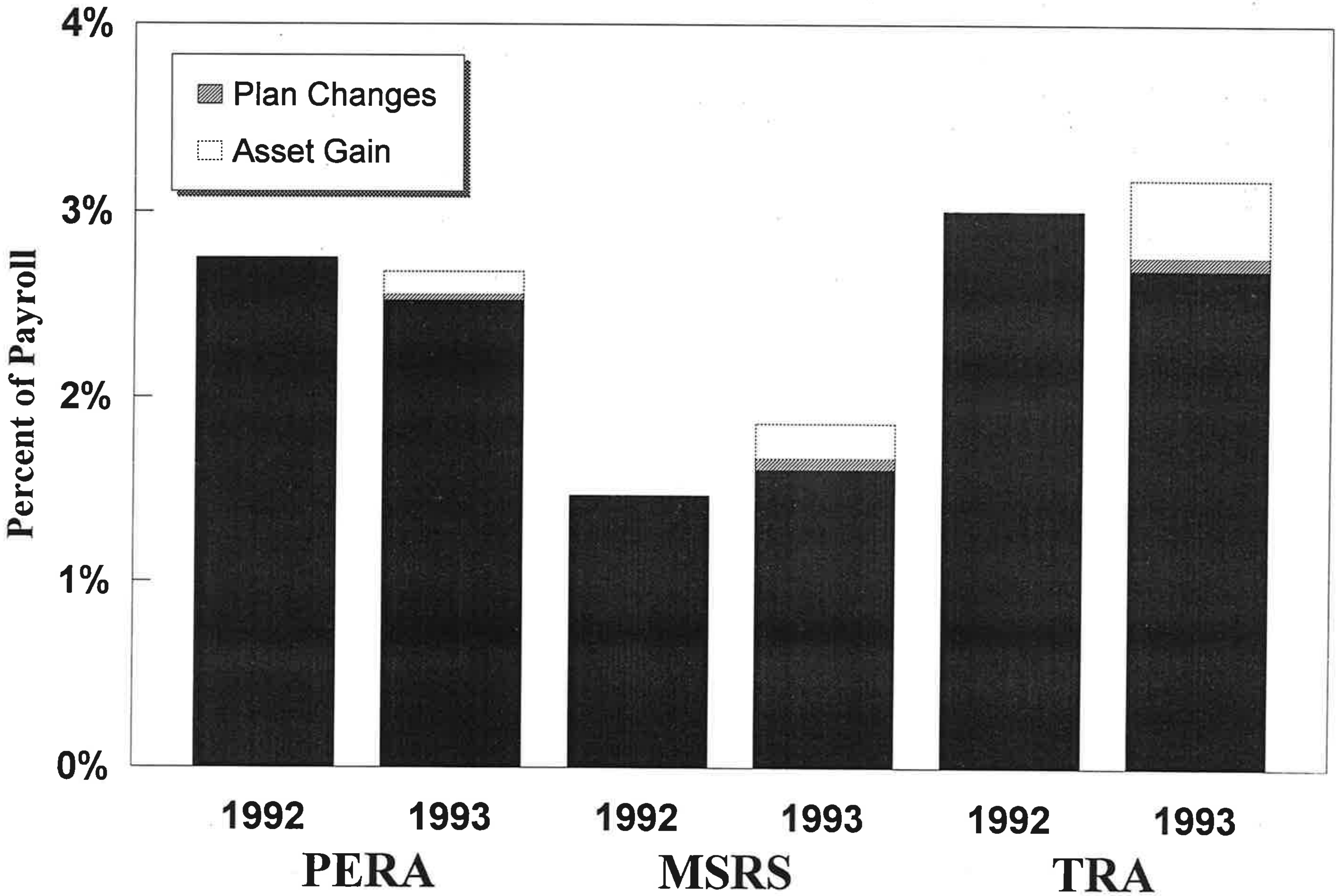
Plan Changes
12%
10%
8%
6%
4%
2%
0%
Percent of Payroll
1992
1993
1992
1993
1992
1993
PERA
MSRS
TRA

Expenses

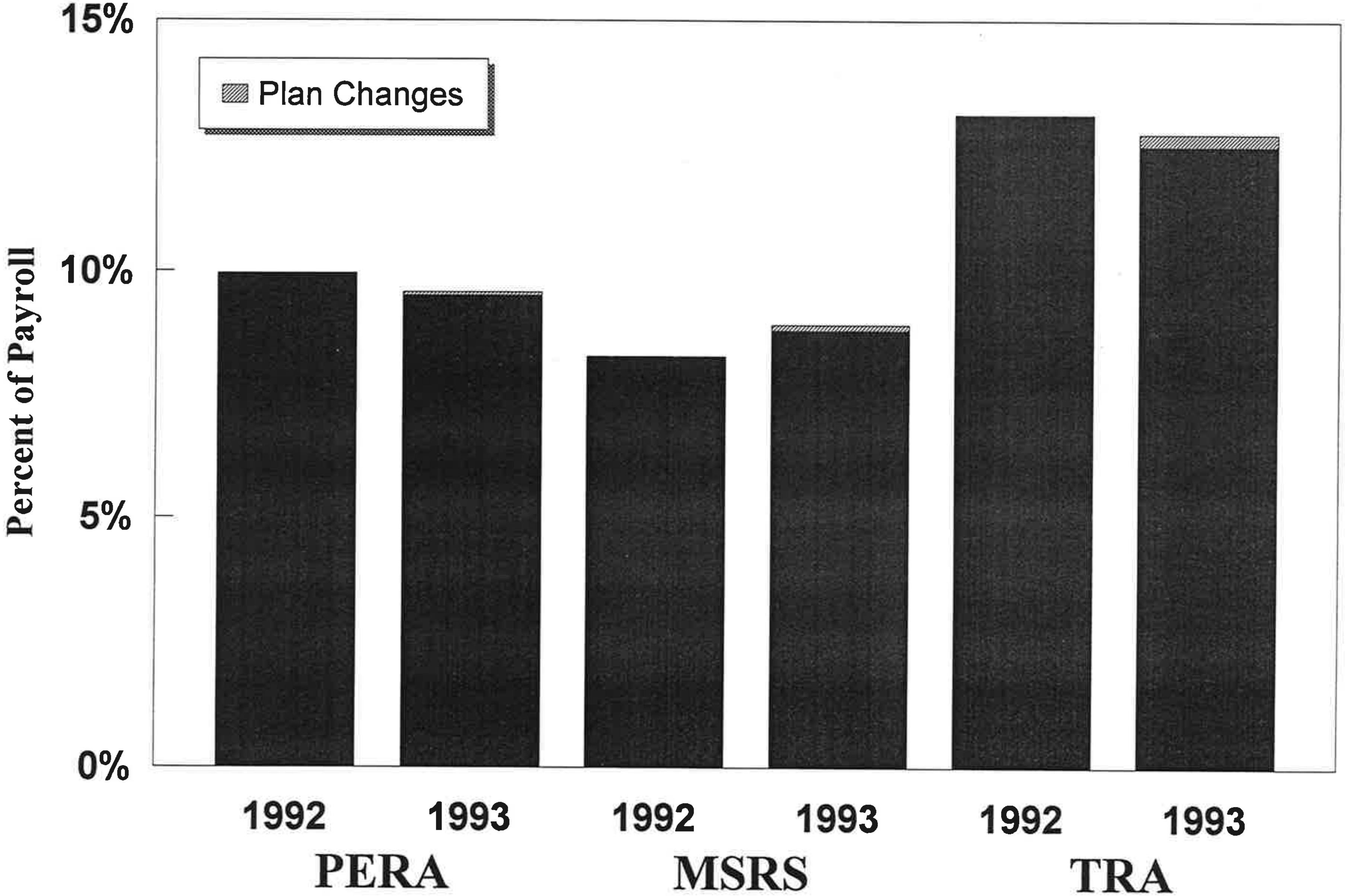


Without Changes
Percent of Payroll
0.5%
0.4%
0.3%
0.2%
0.1%
0.0%
1992
1993
1992
1993
1992
1993
PERA
MSRS
TRA

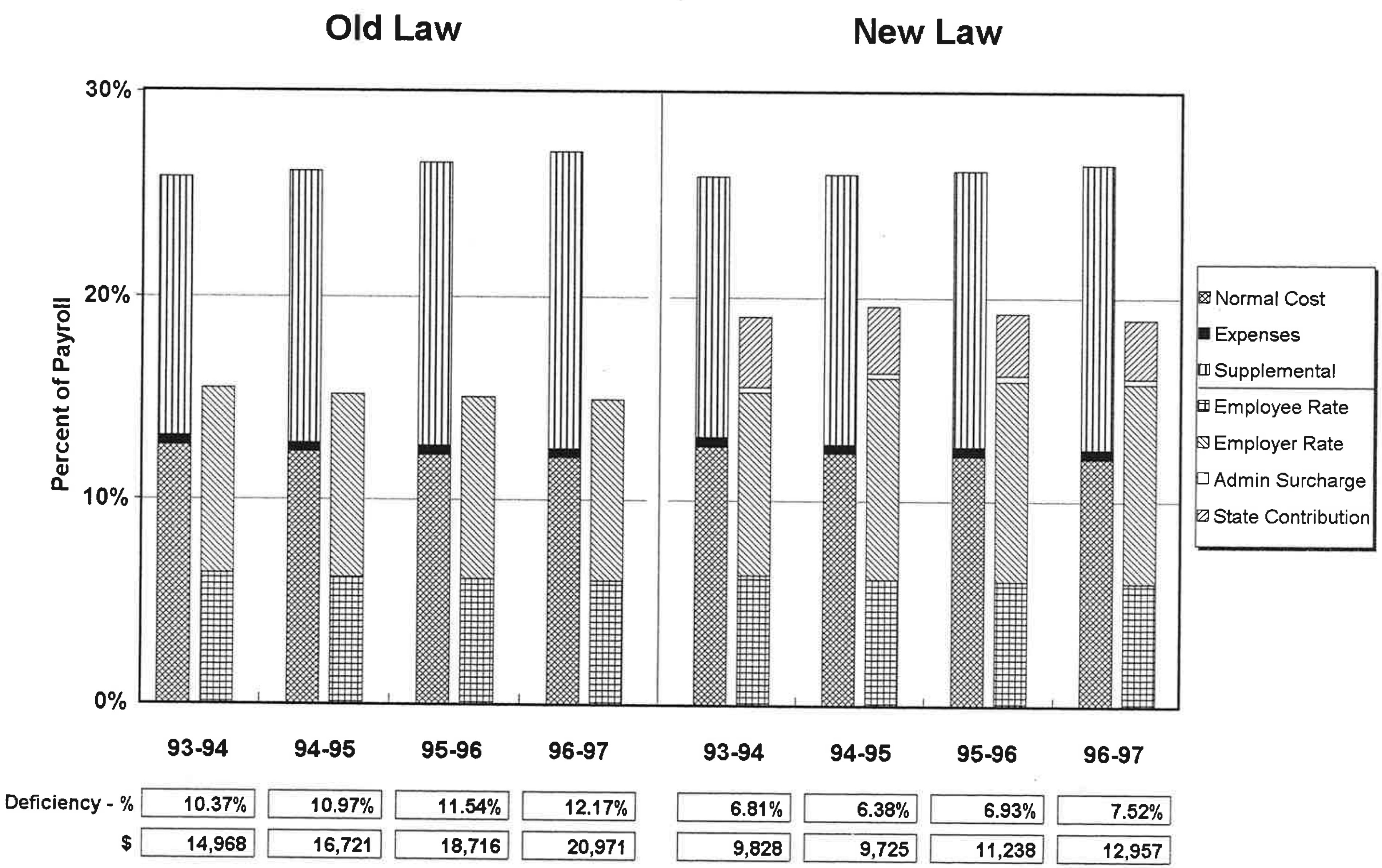
Supplemental Contribution



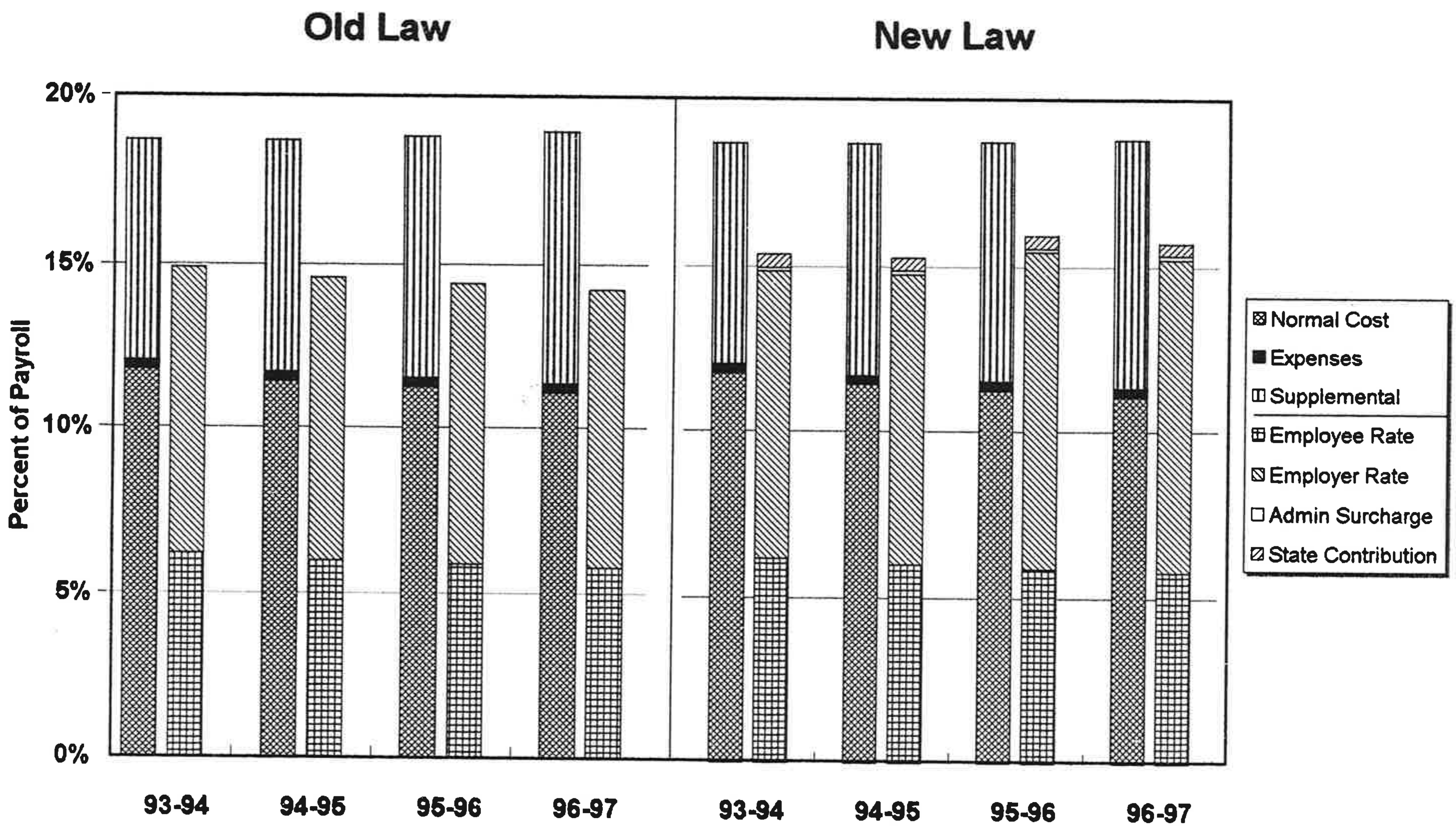
Total Required Contribution



Minneapolis Teachers Retirement Fund



St. Paul Teachers Retirement Fund



	93-94	94-95	95-96	96-97	93-94	94-95	95-96	96-97
Deficiency - %	3.78%	4.09%	4.38%	4.71%	3.31%	3.38%	2.79%	3.07%
$	4,945	5,560	6,265	7,069	4,333	4,601	3,988	4,612