



**STATE OF
MINNESOTA**

**SUMMARY OF
1996
ACTUARIAL VALUATIONS**



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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, 1996 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 1996-97 funding levels, as well as summaries of significant plan changes and actuarial assumptions used. More information on the proposed assumption changes has been provided in a separate report along with a more detailed description of the proposed asset valuation method.

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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STATE OF MINNESOTA

SUMMARY OF 1996 ACTUARIAL VALUATIONS

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STATE OF MINNESOTA

SUMMARY OF 1996 ACTUARIAL VALUATIONS

I. 1996-97 FUNDING LEVELS (TABLES 1-A, 1-B, 1-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.

PERA

1. The Public Employees plan showed a modest deficiency for 1995. This deficiency increased in 1996 mainly due to an increase in Normal Cost as a percentage of covered payroll. Funding ratios have improved for current accruals of benefits while projected benefit funding had a marginal drop. Total active membership increased by about 2.2%. The deficiency remains at a level which suggests close monitoring.

We looked closely into the question of why the contribution deficiency worsened modestly despite favorable asset experience. Most of the increase in Normal Cost, and slightly over one-half of the increase in Actuarial Accrued Liability, can be

traced to refinements made in our valuation programming. A separate memo has been provided discussing these changes. The rest of the loss reflected in the Actuarial Accrued Liability remains a mystery. Since P.E.R.A.'s actuarial consultant observed similar results, we conclude that this loss is associated with adverse demographic experience (retirements and withdrawals) or with unidentified data changes or adjustments or some combination thereof. We will be looking for further clues as we complete our quadrennial experience analysis this spring.

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. The sufficiency is expected to be somewhat diminished under the alternative assumptions being proposed.
3. The Police and Fire Consolidation plan still requires substantial contribution levels. Since the statutes require full current funding, no deficiency is noted; however, the required rate is almost 23% 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 have increased over last year. An issue of concern is the ability of each individual consolidation account to transfer the required reserve 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 solid contribution sufficiency. The funding ratios improved significantly from the prior year. The plan experienced investment and other data-related gains which increased the contribution sufficiency.
5. The State Patrol plan shows a contribution sufficiency which is about the same as last year. General accrued benefit funding ratios are slightly higher than last year.
6. The State Correctional Employees plan shows a small contribution deficiency. This deficiency is due mainly to an increase in the normal cost. Under the proposed alternative assumptions, the plan shows a much larger deficiency. It should be noted, however, that this plan has assets which are significantly in excess of its Actuarial Accrued Liability. Statutes do not allow this "negative unfunded" to be recognized for purposes of determining the Required Contribution. If we were allowed to specifically recognize this excess, the plan would appear to be sufficient.

Another issue arose this year in connection with the valuation of benefits under this plan. Due to very favorable MPRIF experience over the last several years while Social Security indices have been increasing at a much more moderate rate, we are concerned that the liabilities associated with the "ultimate benefits" for participants who retired between 1990 and 1996 may be understated. We believe that the procedures used by MSRS to determine and maintain the "ultimate benefit level" may need to be reviewed and refined.

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 adopted for the Judges plan.

8. The Judges plan actuarial funding requirement decreased due to actuarial gains related to investment return, salaries and other data. Funding ratios continue to improve and issues concerning short-term cash shortages have lessened.

TEACHERS

9. The Teachers Retirement Association plan showed a contribution sufficiency for 1996 which was significantly higher than 1995. This is the result of actuarial gains during the year from salaries, investment return, mortality and other items. The accrued benefit funding ratios showed an increase over the prior year, primarily due to these gains.

10. The Duluth Teachers plan has a contribution deficiency of 2.31% this year compared to a deficiency of 1.94% of payroll last year. This plan experienced an overall actuarial gain in the prior year. We expect the deficiency to be significantly reduced by a change in actuarial assumptions expected to be adopted with the July 1, 1997 valuation.
11. The St. Paul Teachers plan contribution deficiency has continued to improve since the last valuation. Most of this improvement is attributable to investment and salary-related gains along with an increase in required funding.
12. The Minneapolis Teachers plan showed a small decrease in the contribution deficiency from last year. This was primarily due to investment and salary-related gains along with a small increase in required funding. ***This deficiency remains a serious problem requiring further corrective action.*** Accrued funding ratios increased slightly 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 a lower payroll which increased the required amortization percentage. Accrued funding ratios were higher from the prior valuation.

We recognize that this year's major legislative initiative will focus on the Pension Uniformity Proposals. Even in this context, we believe the Commission should attempt to focus legislative consideration on the following priorities:

- ◆ Adoption of the proposed and agreed upon assumption changes.
- ◆ Consideration and adoption of the proposed asset valuation method.
- ◆ Continue to assess the underfunding problems of the MTRFA plan. Even considering the special additional contributions, this plan still needs additional corrective action. As the mix of participants changes from Basic to Coordinated, the measured deficiency will continue to worsen.

- ◆ Closely monitor the funding status of the Public Employees' plan. While not yet at a critical stage, care should be taken so that any legislative package results in a funding improvement; any further increase in the funding deficiency could be very problematic.
- ◆ We still favor the initiation of prefunding in the Legislators and Elective State Officers plans.

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

TABLE 1-A: 1996-97 FUNDING LEVELS (PERCENTAGES)

Fund	Section 356.215 Requirements				Statutory Requirements			Sufficiency/ (Deficiency)
	Normal Cost	Supplemental Cost	Expense	Total	Employee	Employer	Total	
Public Employees (Chapter 353)	6.85%	2.71%	0.19%	9.75%	4.29%	4.58%	8.88%	(0.87)%
Police and Fire (Chapter 353)	19.73	(4.75)	0.13	15.11	7.60	11.40	19.00	3.89
Police and Fire Consolidation	20.56	2.23*	0.00	22.79	7.60	15.19	22.79	0.00
State Employees (Chapter 352)	6.67	0.42	0.12	7.21	4.07	4.20	8.27	1.06
State Patrol (Chapter 352B)	21.19	0.00	0.14	21.33	8.92	14.88	23.80	2.47
Correctional (Chapter 352)	11.05	0.00	0.16	11.21	4.90	6.27	11.17	(0.04)
Legislators (Chapter 3A)	20.78	22.83	0.35	43.96	9.00	Terminal Funding	N/A	N/A
Elective State Officers (Chapter 352C)	13.90	28.96	0.63	43.49	9.00	Pay-as-you-go funding	N/A	N/A
Judges (Chapter 490)	17.30	9.57	0.14	27.01	6.36	22.00	28.36	1.35
Teachers (Chapter 354)	10.49	2.13	0.16	12.78	6.51	8.15	14.66	1.88
Duluth Teachers (Chapter 354A)	9.18	3.72	0.70	13.60	5.50	5.79	11.29	(2.31)
St. Paul Teachers (Chapter 354A)	10.91	5.83	0.23	16.97	5.79	10.12**	15.91	(1.06)
Minneapolis Teachers (Chapter 354A)	11.85	12.99	0.31	25.15	6.03	13.15**	19.18	(5.97)
Minneapolis Employees (Chapter 422A)	18.50	25.51	1.73	45.74	9.75	35.99**	45.74	0.00

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

** Includes State contributions of 0.62% for St. Paul Teachers, 13.87% for Minneapolis Employees, and total special contributions of 3.33% for Minneapolis Teachers.

TABLE 1-B: PATTERN OF SUFFICIENCY/(DEFICIENCY): 1994-1996

Fund	Actuarial Requirements			Statutory Requirements			Sufficiency/(Deficiency)		
	1994	1995	1996	1994	1995	1996	1994	1995	1996
Public Employees	9.76%(2)	9.61%	9.75%	8.90%	8.91%	8.88%	(0.86)%	(0.70)%	(0.87)%
Police & Fire	17.28	16.49	15.11	19.00(3)	19.00	19.00	1.72	2.51	3.89
Police & Fire Consolidation	33.63	29.74	22.79	33.63	29.74	22.79	0.00	0.00	0.00
State Employees	9.15(2)	8.05(2)	7.21	8.27	8.27	8.27	(0.88)	0.22	1.06
State Patrol	21.79(1)	21.34(2)	21.33	23.38	23.80	23.80	1.59	2.46	2.47
Correctional	11.30	11.11(2)	11.21	11.17	11.17	11.17	(0.13)	0.06	(0.04)
Legislators	38.34	41.54	43.96	T.F.	T.F.	T.F.	N/A	N/A	N/A
Elective State Officers	42.00	43.58	43.49	P.A.Y.G.	P.A.Y.G.	P.A.Y.G.	N/A	N/A	N/A
Judges	28.27	27.32	27.01	28.36	28.36	28.36	0.09	1.04	1.35
Teachers	14.73(2)	14.30	12.78	14.66	14.66	14.66	(0.07)	0.36	1.88
Duluth Teachers	10.36	13.23(1)	13.60	10.29	11.29	11.29	(0.07)	(1.94)	(2.31)
St. Paul Teachers	18.63	17.96	16.97	15.45	15.87	15.91	(3.18)	(2.09)	(1.06)
Minneapolis Teachers	25.03	25.18	25.15	19.16	19.00	19.18	(5.87)	(6.18)	(5.97)
Minneapolis Employees	46.21	44.48	45.74	46.21	44.48	45.74	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 1-C: ACCRUED BENEFIT FUNDING RATIOS: 1994-1996

(Dollars in Millions)

Fund	Current Assets			P.V. of Accrued Benefit			A.B. Funding Ratio		
	1994	1995	1996	1994	1995	1996	1994	1995	1996
Public Employees	\$4,747	\$5,138	\$5,786	\$5,626 ⁽²⁾	\$5,994	\$6,609	84.38%	85.72%	87.56%
Police & Fire	1,235	1,386	1,633	1,021	1,113	1,243	120.96	124.49	131.33
Police & Fire Consolidation	637	675	754	704	723	769	90.43	93.44	98.01
State Employees	3,158	3,462	3,976	3,376 ⁽²⁾	3,339 ⁽²⁾	3,612	93.54	103.68	110.06
State Patrol	263	285	324	264	272 ⁽²⁾	292	99.34	104.82	110.78
Correctional	148	165	194	131	134 ⁽²⁾	150	112.70	123.52	129.60
Legislators	19	21	23	43	48	51	43.22	44.09	43.83
Elective State Officers	0.4	0.4	0.4	2.7	2.8	2.8	13.28	13.50	14.49
Judges	50	57	65	95	99	105	53.15	57.50	62.05
Teachers	7,612	8,348	9,541	8,464 ⁽²⁾	9,050	9,697	89.94	92.25	98.40
Duluth Teachers	134	143	157	129	162 ⁽¹⁾	177	103.56	88.44	88.56
St. Paul Teachers	407	446	495	564	600 ^{(1),(2)}	631	72.16	74.23	78.39
Minneapolis Teachers	514	555	613	874	964	1,009	58.81	59.23	60.74
Minneapolis Employees	909	965	1,019	1,170	1,195	1,232	77.72	80.77	82.66

(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	11	1	\$12,882,931	\$ 4,069,787	A
Albert Lea Police	2	5	10,122,812	4,528,828	A
Anoka Police	2	0	2,894,563	1,890,379	B
Austin Police	4	2	10,727,483	6,374,112	B
Bloomington Police	21	11	48,506,414	15,516,433	A
Brainerd Police	2	6	3,933,447	2,029,762	B
Buhl Police	0	0	1,079,980	542,121	A
Chisholm Fire	2	0	1,891,087	1,295,218	D
Chisholm Police	1	0	1,213,851	1,005,649	D
Columbia Heights Fire	1	0	1,937,116	956,861	A
Columbia Heights Police	3	0	3,781,872	2,842,328	C
Crookston Fire	4	1	1,441,806	582,176	C
Crystal Police	5	2	9,514,377	3,007,416	A
Duluth Fire	40	25	33,851,081	26,726,268	B*
Duluth Police	18	23	41,268,378	25,787,105	B*
Faribault Fire	1	3	5,002,844	3,936,051	C
Faribault Police	3	3	4,276,092	3,063,760	C
Fridley Police	3	3	8,545,375	4,392,084	A
Hibbing Fire	3	9	6,346,375	5,073,173	D
Hibbing Police	7	4	5,566,155	3,290,542	C

COMMENT CODE:

- A - **Currently well-funded**; special assessment for MPRIF transfer unlikely for foreseeable future.
- B - **Significant** special assessment for MPRIF transfer within five years is possible but not highly probable.
- C - **Chance** of special assessment this year is small, but chance of special assessment within five 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	0	\$ 7,419,861	\$ 6,724,237	C
New Ulm Police	3	0	4,860,868	1,991,066	A
Red Wing Fire	4	0	6,702,369	2,910,356	A
Red Wing Police	4	2	9,425,588	258,540	A
Richfield Police	4	6	14,116,948	4,301,231	A
Rochester Fire	18	6	29,358,453	4,646,676	A
Rochester Police	20	7	30,259,687	12,039,238	A
St. Cloud Fire	9	4	10,951,530	8,580,005	C
St. Louis Park Fire	6	4	11,912,177	1,598,992	A
St. Louis Park Police	11	8	20,947,066	7,577,160	A
St. Paul Fire	70	96	157,889,616	95,992,946	A
St. Paul Police	116	110	194,979,873	93,968,752	A
South St. Paul Fire	3	2	5,916,183	4,326,167	C
West St. Paul Fire	4	3	7,861,693	2,260,509	A
West St. Paul Police	4	2	7,864,993	2,750,501	A
Winona Fire	3	3	9,965,786	8,451,546	C
Winona Police	7	5	8,645,511	6,300,580	B

COMMENT CODE:

- A - **Currently well-funded**; special assessment for MPRIF transfer unlikely for foreseeable future.
- B - **Significant** special assessment for MPRIF transfer within five years is possible but not highly probable.
- C - **Chance** of special assessment this year is small, but chance of special assessment within five 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, 1996 Actuarial Valuation, we highlight the following:

Public Employees (Chapter 353): None

Police and Fire (Chapter 353): None

Police and Fire Consolidation: Added two new accounts -- Brainerd Police and Faribault 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 approves the increase. All new accounts, including those listed above, come in at 2.65%. As of July 1, 1996, the following municipalities had not taken formal additional action to approve the change in the benefit accrual factor and our valuation reflects continuation of the 2.5% multiplier for these municipalities:

- Crookston Fire
- Mankato Fire

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): Effective July 1, 1996, additional funding is provided through a redirection of 21% of excess police and fire amortization aid to the Fund. Effective July 1, 1998, St. Paul Public Schools is required to make additional contributions to the Fund.

Minneapolis Teachers (Chapter 354A): Effective July 1, 1996, additional funding is provided through a redirection of 49% of excess police and fire amortization aid to the Fund. Effective July 1, 1998, the City of Minneapolis and Minneapolis Public Schools are each required to make additional contributions to the Fund.

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 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, 1996 Actuarial Valuation for that Fund.

In our opinion the assumptions used for July 1, 1996 valuations are reasonable and well within the mainstream of current actuarial practice. Experience studies and assumption reviews have been completed for most of the other plans which fall under the jurisdiction of the LCPR. A complete set of recommendations have been made and the resulting cost implications are provided in the Appendices to this report.

TABLE III-A: JULY 1, 1996 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) (with exceptions)
State Employees (Chapter 352)	8.5%/5.0%	*/Prior Year Salary Increased	N/A	3.5% Implied by 5.0% Interest Rate
State Patrol (Chapter 352B)	8.5%/5.0%	6.5%/Prior Year Salary Increased	N/A	3.5% Implied by 5.0% Interest Rate
Correctional (Chapter 352)	8.5%/5.0%	6.5%/Prior Year 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%	*/Prior Year 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	2% Implied by 6.5% 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 1.0198%	N/A	3.5% Implied by 5.0% Interest Rate

*Graded rates using a 5.0% base increase plus a merit scale.

TABLE III-B: JULY 1, 1996 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: 4.50% @ 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: 4.50% @ 35 1.00% @ 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

TABLE III-C: JULY 1, 1996 ACTUARIAL ASSUMPTIONS - CATEGORY 3

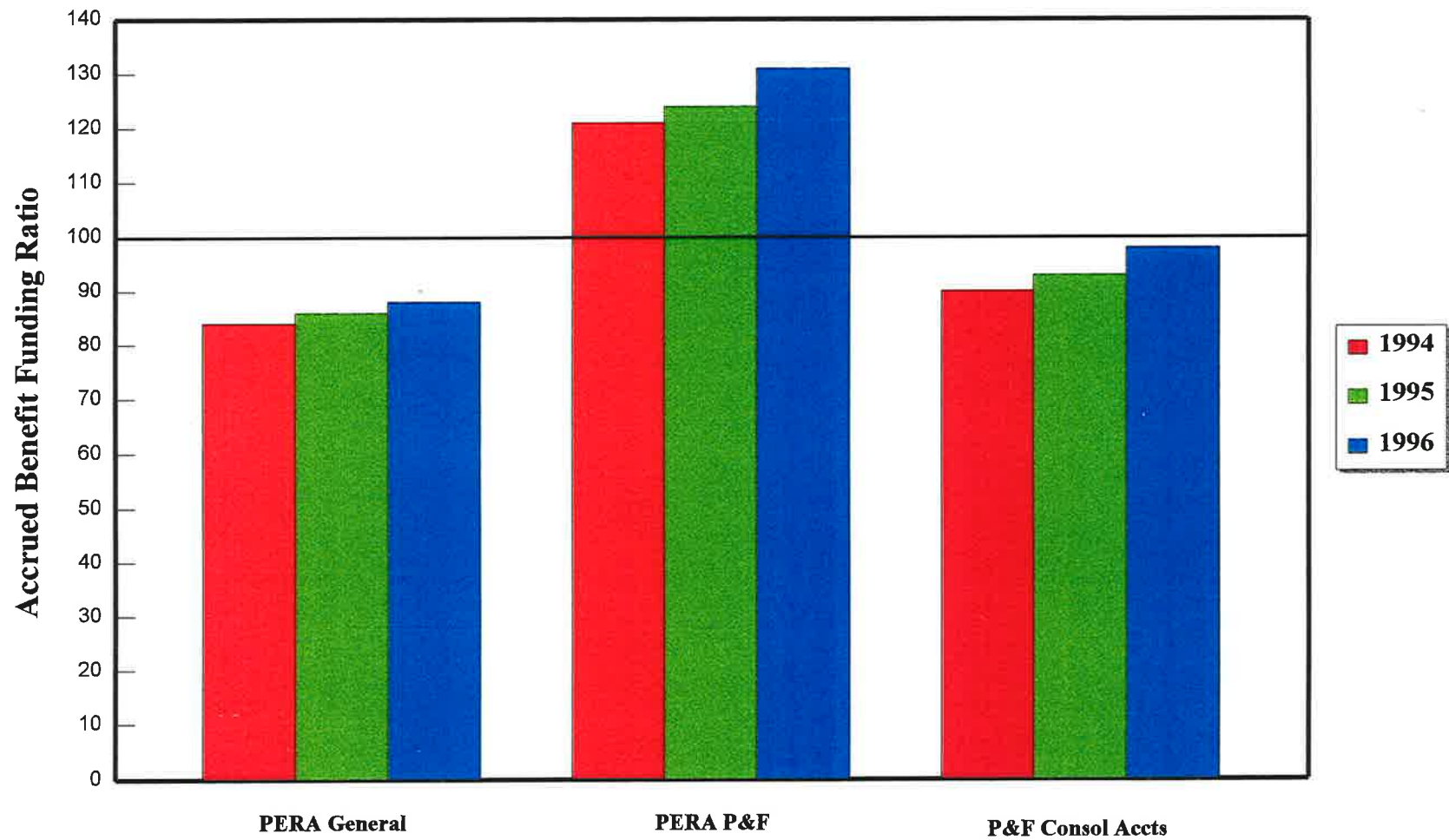
(Highlighted box indicates change from prior year.)

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 0%/ 0% for 75% 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	None
Minneapolis Teachers (Chapter 354A)	80%/60% married	Prior year 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

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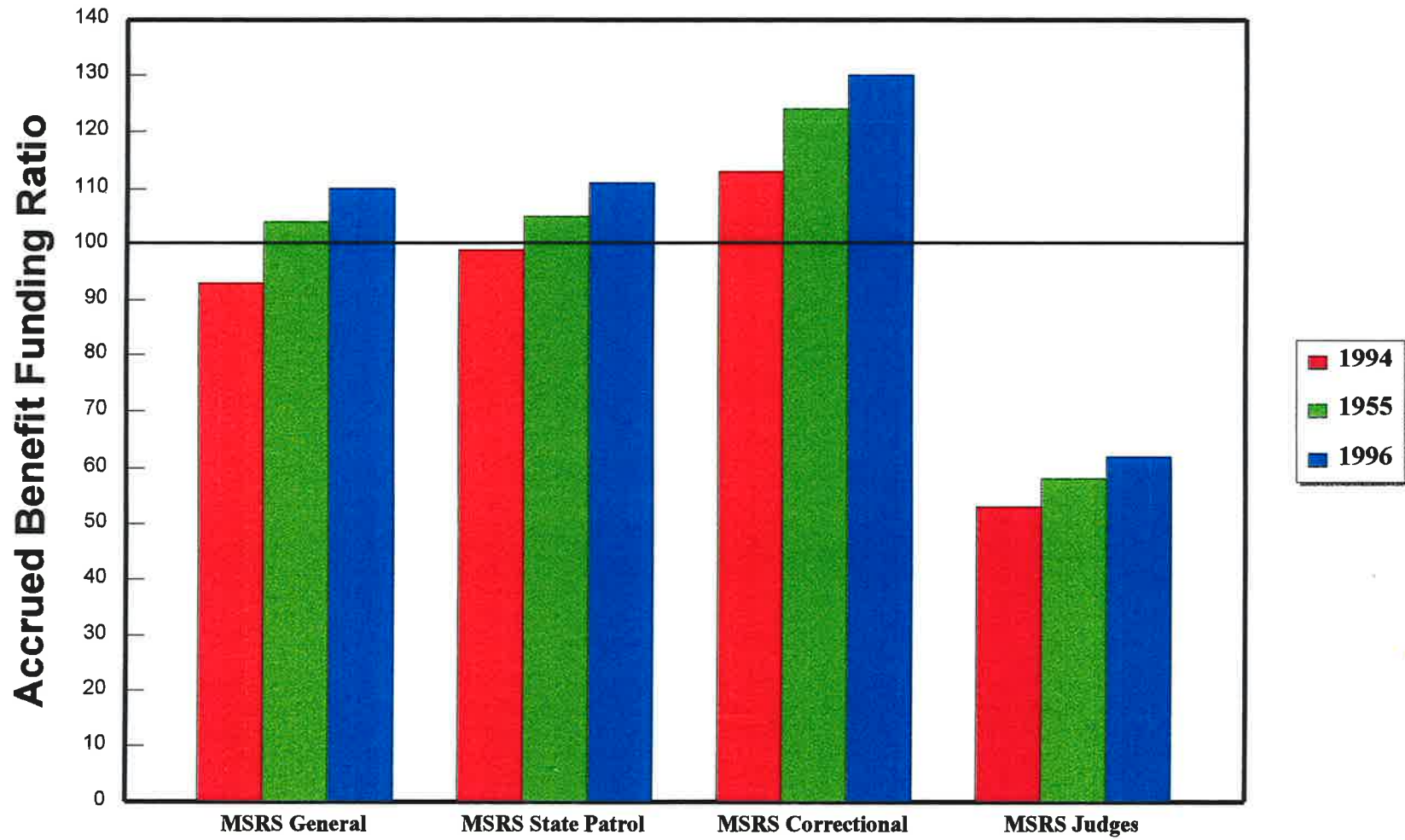
FUNDING RATIOS

PERA



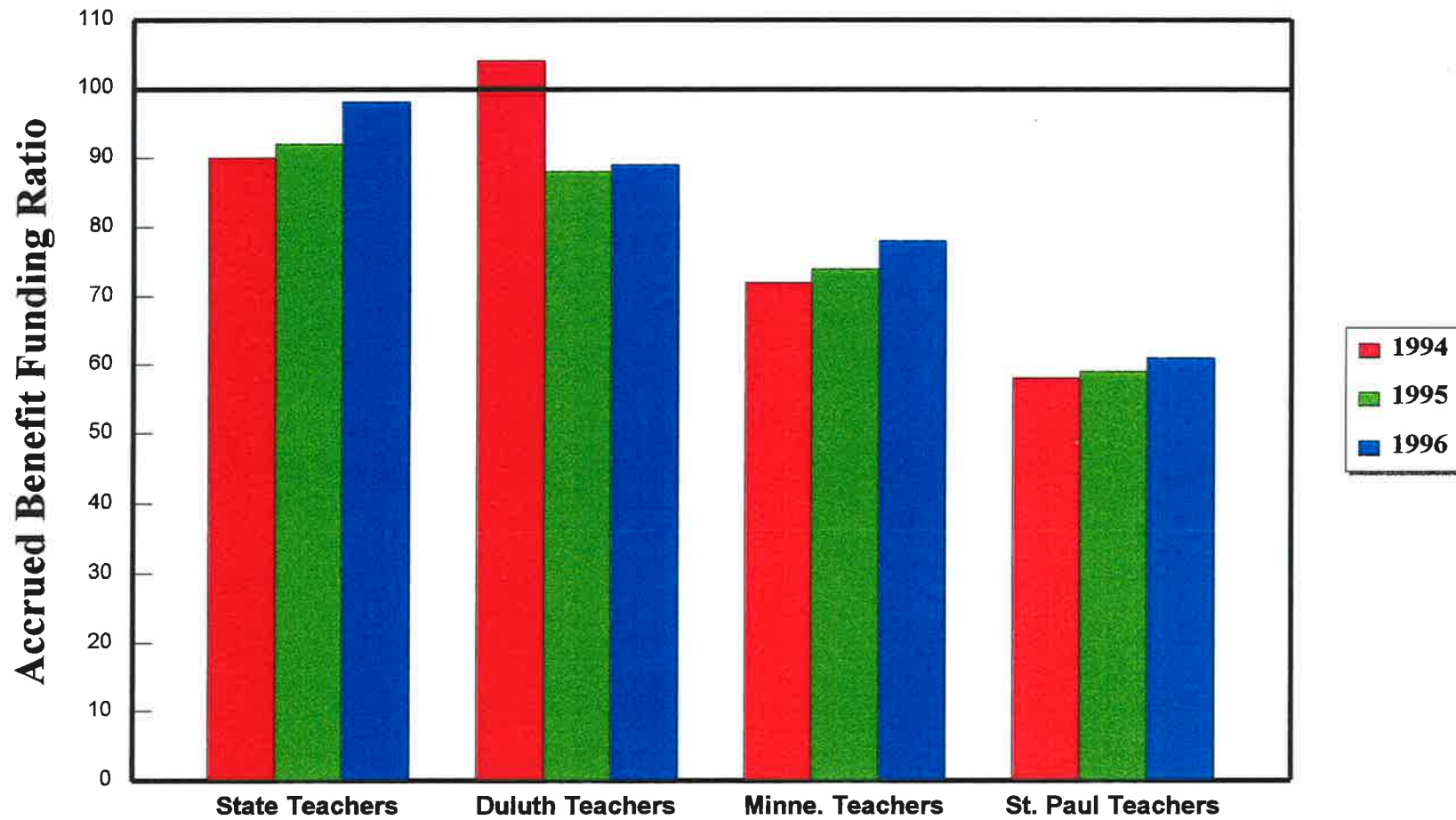
FUNDING RATIOS

MSRS

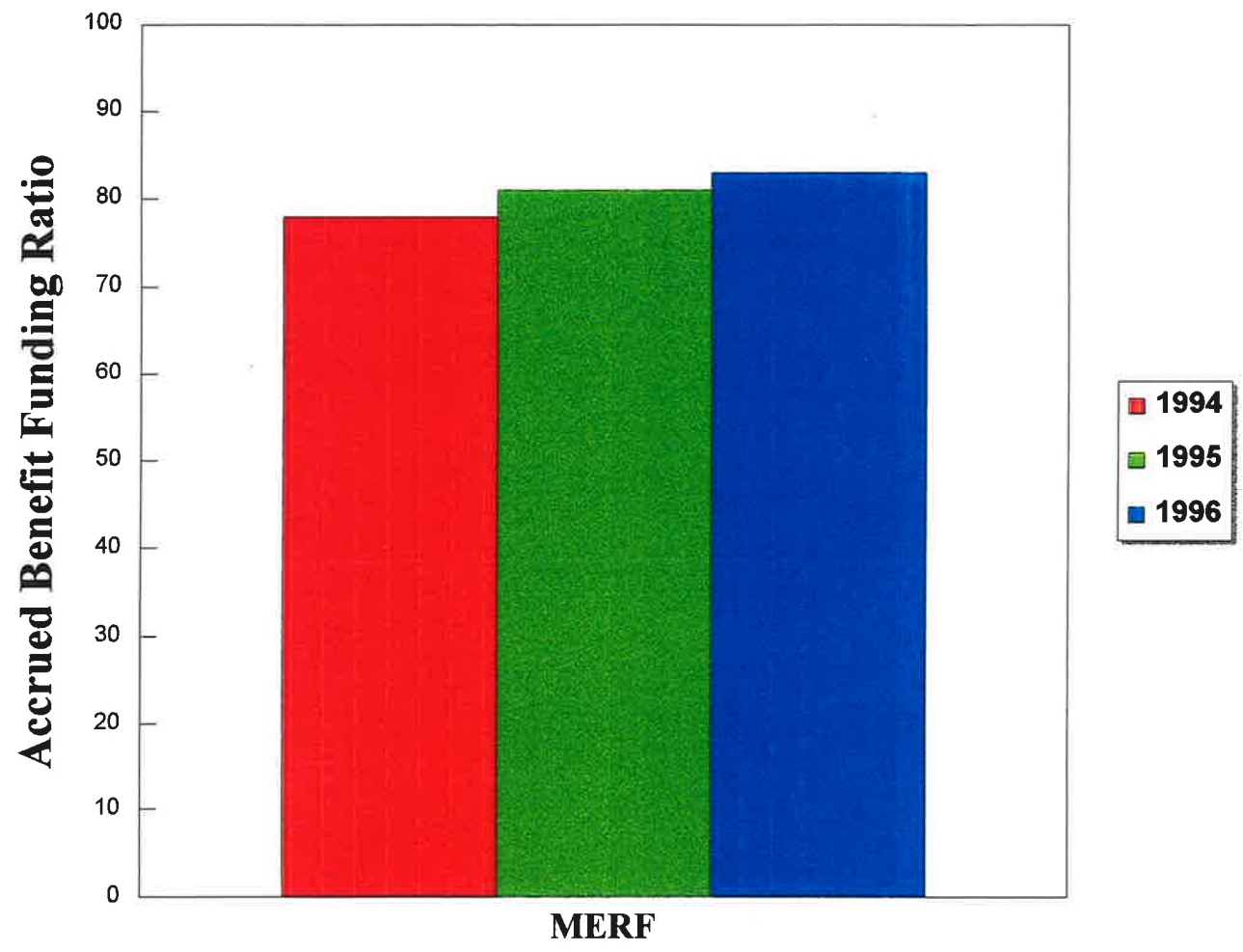


FUNDING RATIOS

TEACHER PLANS

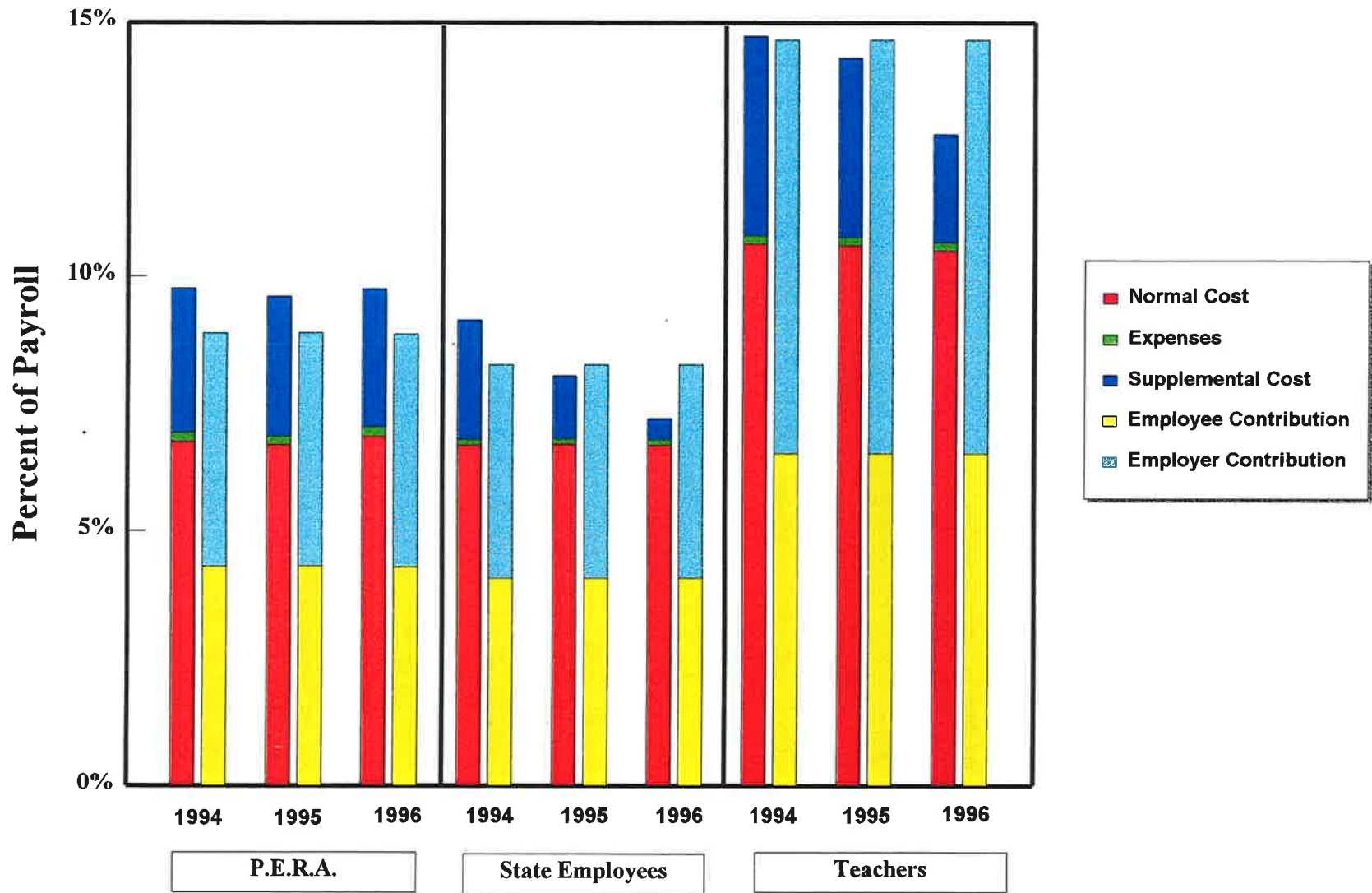


FUNDING RATIOS
MERF



Statewide Funds

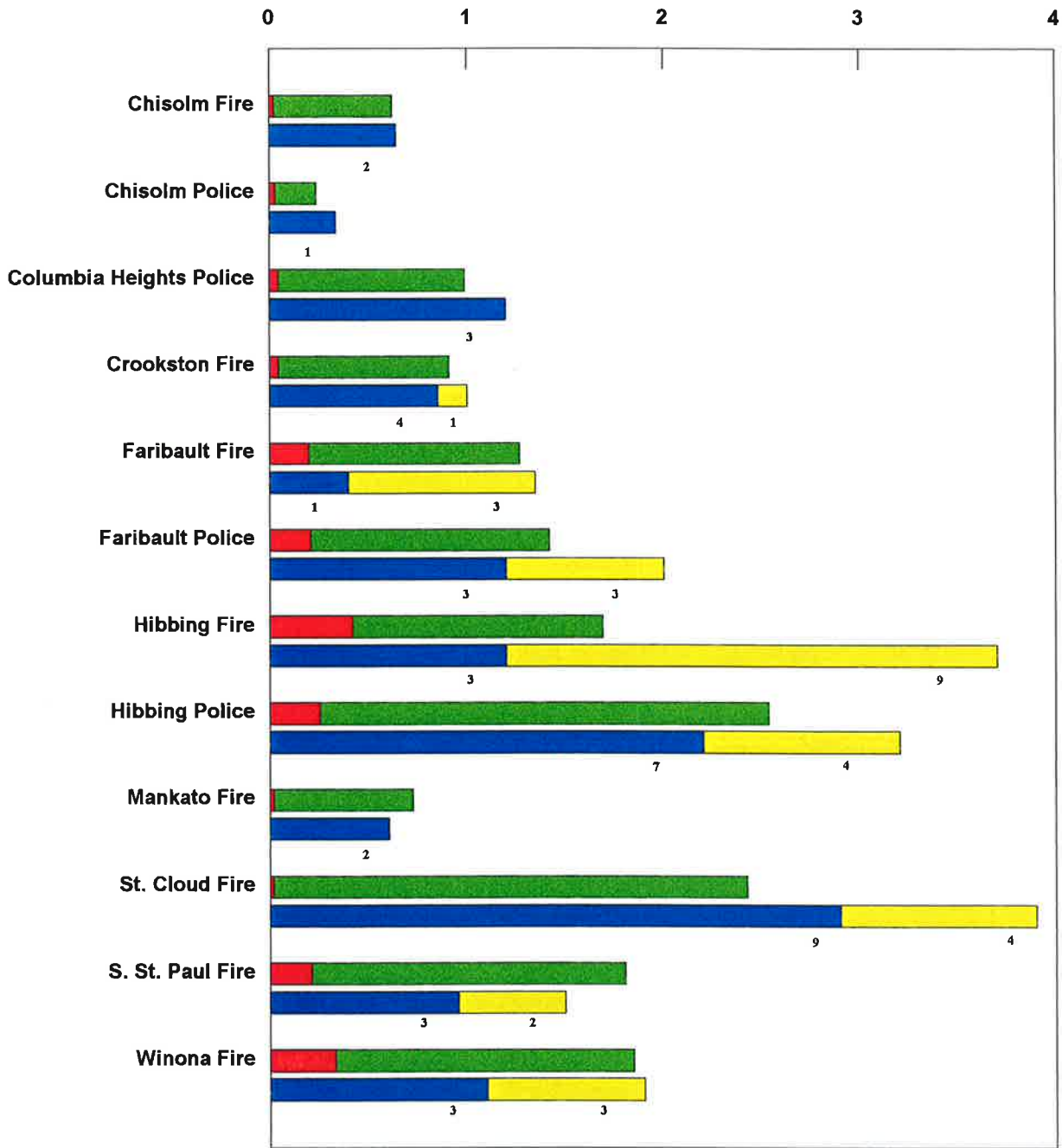
3 Year Experience



Consolidated Funds

Funding Status C or D

Millions



■ Current One-year Funding Requirement	■ Assets Available to Transfer
■ Immediate Exposure	■ Additional 5-Year Exposure

1	2
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Number Eligible to Retire