
1990 Actuarial Valuation Summary Report

*Prepared by the Commission Actuary
for the Legislative Commission on
Pensions and Retirement*

February 1991

THE  COMPANY

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THE *Wyatt* COMPANY

Summary and Recommendations

This report summarizes the results of the 1990 actuarial valuations performed by the Commission Actuary. The 14 plans evaluated include all plans for public employees in the State of Minnesota that are accepting new members with the exception of the Volunteer Firefighter Relief Associations.

The primary criteria used in evaluating the plans are:

- ▼ The adequacy of current contributions.
- ▼ The level of funded percentages.
- ▼ The potential for future insolvency if contributions are inadequate.

Contribution Adequacy

The actuarial calculations show that, on average, the 14 plans have an annual contribution deficiency equal to 0.5% of payroll. During the 1991 fiscal year, four plans are projected to have a contribution sufficiency totaling \$10.1 million and five plans are projected to have a deficiency totaling \$42.2 million.

Minneapolis Teachers continues to have the largest annual contribution deficiency at 13.0% of payroll, or \$16.1 million.

St. Paul Teachers also continues to have an annual contribution deficiency, but on a much smaller scale than the Minneapolis Teachers. This year's deficiency is 3.2% of payroll, or \$3.5 million.

The other two plans with annual contribution deficiencies in excess of \$1 million are Public Employees with a \$16.4 million deficiency, and State Teachers with a \$6 million deficiency. However, in both cases, the deficiency is less than 1% of payroll.

Funded Percentage

The second criteria used to evaluate the soundness of the plans is the funded percentage. The funded percentage compares accumulated assets to actuarial liabilities. All the plans but two exceed 70%.

The plan with the lowest funded percentage is Minneapolis Teachers at 50%. The second lowest is St. Paul Teachers at 64%.

Over the past five years, investment returns on the assets have been substantial. These investment returns have made a substantial contribution to the funded percentages of the various plans. However, the funded percentage for Minneapolis Teachers has only increased from 49% to 50% during that five year period. The funded percentage for St. Paul Teachers has increased from 52% to 64% during that same time frame.

Solvency

A third solvency criteria has been applied to Minneapolis Teachers and St. Paul Teachers because long-term contribution deficiencies combined with a low funded percentage can threaten the solvency of any plan.

A projection of future assets shows that the Minneapolis Teachers Fund will increase slightly over the next 10 years and then decrease rapidly to zero by the year 2011. At that time, there will be no money available for benefit payments to retirees or survivors.

A projection of the St. Paul Teachers Fund also shows assets growing and then diminishing slightly toward the end of the 30-year projection period.

Recommendations

We continue to recommend that action be taken to correct the contribution deficiencies in the Minneapolis Teachers Plan. With each passing year, the cost of correcting the problem becomes greater. In order to achieve the funding objectives, the contribution deficiencies plus the interest on those amounts have to be made up.

The St. Paul Teachers Plan has a similar but much less critical situation. However, action should be taken now before the cost of the solution becomes more expensive.

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Introduction

The purpose of this report is to provide the members of the Legislative Commission on Pensions and Retirement a summary of the actuarial status of the pension plans evaluated by the Commission Actuary, The Wyatt Company.

This summary was produced from information contained in the July 1, 1990 actuarial valuation reports and reports for prior years.

This report focuses on four major topics:

- ▼ The adequacy of current contributions.
- ▼ The level of funded percentages.
- ▼ The potential of solvency problems.
- ▼ A review of the past five years.

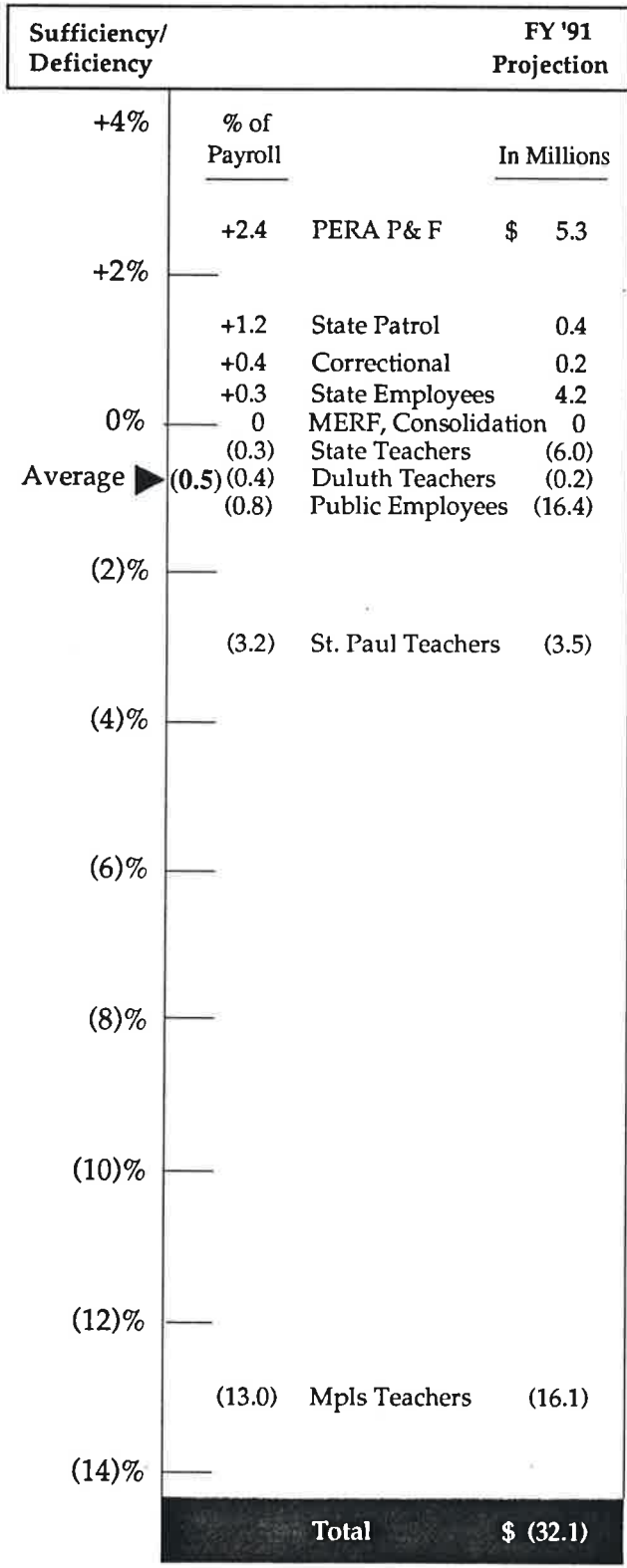
In addition, the appendices to this report contain information on:

- ▼ Characteristics of the plans.
- ▼ Actuarial assumptions.
- ▼ Definition of terms.

The table below lists the plans discussed in this report. This report does not cover 29 Local Police and Fire Pension Funds, the University of Minnesota Supplemental Retirement Plan and numerous volunteer firefighter pension plans. Only the latter group accepts new members.

<u>Administrator</u>	<u>Plan</u>
MSRS	State Employees
MSRS	Correctional Employees
MSRS	State Patrol
MSRS	Judges
MSRS	Legislators
MSRS	Elective State Officers
PERA	Public Employees
PERA	Police and Fire
PERA	P & F Consolidation
TRA	State Teachers
MERF	Minneapolis Employees
Mpls Teachers	Mpls Teachers
St. Paul Teachers	St. Paul Teachers
Duluth Teachers	Duluth Teachers

Section 1: Contribution Adequacy



Contribution adequacy is measured by comparing the statutory contribution to the required contribution.

The statutory contribution is an amount set forth in Minnesota law. For most plans, the contribution is expressed as a percentage of pay — one amount to be paid by the employer and another amount to be paid by active members.

The required contribution is an amount calculated by the Commission Actuary. The Commission Actuary uses prescribed methods and assumptions to determine this amount. As a rule, the contribution is composed of three parts — normal cost, supplemental contribution and expenses.

A contribution sufficiency occurs when the statutory contribution is larger than the required contribution. A contribution deficiency occurs when the required contribution is larger than the statutory contribution.

The 1990 actuarial valuations disclosed that:

- ▼ Four plans had a contribution sufficiency totaling \$10.1 million, and
- ▼ Five plans had a contribution deficiency totaling \$42.2 million.

The net effect of the sufficiencies and deficiencies is a 1990 contribution deficiency of 0.5% of payroll. This net deficiency is projected to be \$32.1 million for fiscal year 1991.

The fund with the largest deficiency is Minneapolis Teachers. This 13.0% of payroll deficiency, or \$16.1 million projected to fiscal year 1991, equals 38% of the deficiency for the five plans with inadequate statutory contributions.

Change in Contribution Adequacy From FY '90 to FY '91 (In Millions)

	FY '90	Statutory Contribution	Required Contribution			FY '91
			Experience	Benefits	Assumptions	
PERA P&F	\$ 7.5	—	\$ 0.4	—	\$ (2.6)	\$ 5.3
State Patrol	1.8	\$ (1.4)	0.0	—	—	0.4
Correctional	1.1	(1.1)	0.2	—	—	0.2
State Employees	10.0	(6.2)	0.4	—	—	4.2
State Teachers	21.5	(16.2)	4.9	—	(16.2)	(6.0)
Duluth Teachers	(0.4)	—	0.2	—	—	(0.2)
Public Employees	9.8	—	(2.1)	—	(24.1)	(16.4)
St. Paul Teachers	(3.9)	—	0.1	—	0.3	(3.5)
Mpls Teachers	(14.3)	—	(1.8)	—	—	(16.1)
Total	33.1	(24.9)	2.3	—	(42.6)	(32.1)

A year ago there was a projected contribution sufficiency of \$33.1 million. Since that time, two major events have occurred:

- ▼ Statutory contributions were reduced for four of the plans, and
- ▼ Actuarial assumptions were changed for five plans (one change had an insignificant impact).

The reduction in statutory contributions is projected to be \$24.9 million for fiscal year 1991. The actuarial assumptions change increased required contributions, and thus diminished contribution adequacy, by \$42.6 million.

The major actuarial assumption changes occurred when new turnover rates were adopted by the PERA plans and the State Teachers.

Two of the plans — Minneapolis Employees and the Police and Fire Consolidation Plans — will not show any contribution sufficiency or deficiency because their contributions are determined each year based on the actuarial calculations.

In addition, there are three small plans — Judges, Legislators, and Elective State Officers — where contributions are made by the State of Minnesota either at the time of retirement or as benefit payments are due.

Section 2: Funded Percentages

1990 Funded Percentage		Unfunded
	%	In Millions
110%		
	105 PERA P&F	\$ 0
100%		
	95 Correctional Employees	5
	94 Duluth Teachers	7
90%		
	90 State Patrol	22
80%		
	78 State Employees	600
	78 State Teachers	1,479
Average ▶	76 76 MERF	260
70%		
	72 Public Employees	1,263
	71 P&F Consolidation	35
60%		
	64 St. Paul Teachers	169
50%		
	50 Minneapolis Teachers	409
	Total	\$4,249

An important measurement of the financial soundness of a pension plan is the funded percentage.

The funded percentage is the ratio of assets to liabilities. The asset value for actuarial purposes is calculated according to State law. The liability measurement is the Actuarial Accrued Liability determined under the Entry Age Normal Actuarial Cost Method. These measurements have been the standard used by the State of Minnesota for a number of years.

The funded percentage for those 11 plans that fund in advance of retirement was 76% in the 1990 valuations. Judges, Legislators and Elective State Officers do not fund in advance of retirement.

The three large state-wide plans and two other plans fall in the 70-80% range. Of the remaining plans:

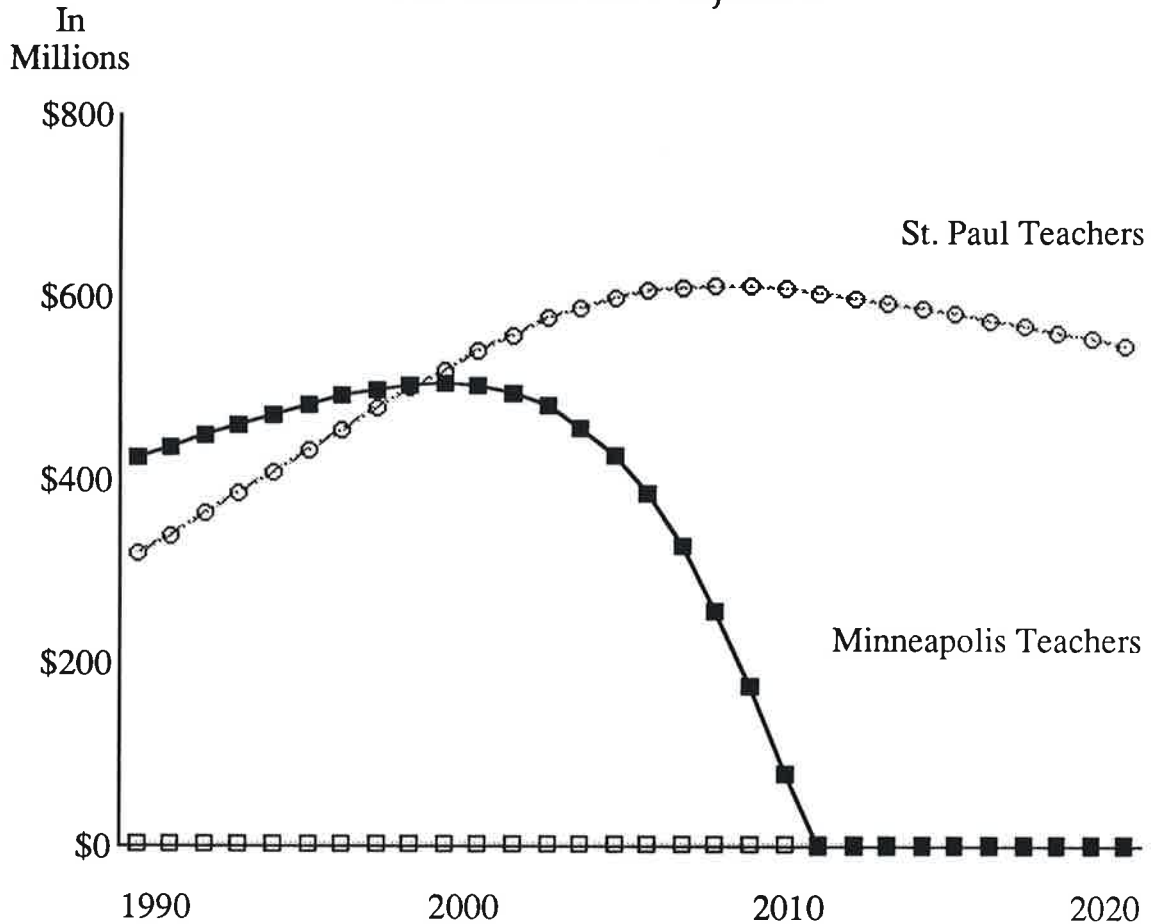
- ▼ One plan is over funded.
- ▼ Three plans are 90% to 95% funded, and
- ▼ Two plans are below the 65% level.

The two plans with the lower funded percentages are the same two with the highest contribution deficiencies — Minneapolis Teachers and St. Paul Teachers.

The total liability remaining to be funded is about \$4.2 billion. The actuarially computed required contribution will fund this outstanding balance by the year 2020. However, the five funds with deficient statutory contributions will not be able to make the full amortization payment on this unfunded amount in fiscal year 1991. The unfunded amount for these five funds is about \$3.3 billion or 78% of the total unfunded.

Section 3: Solvency

Current Assets Projection



As noted earlier in this report Minneapolis Teachers and St. Paul Teachers have the largest contribution deficiencies and the lowest funded percentages.

Asset values were projected to the year 2020 for each plan to evaluate the solvency of each of the funds.

Our projections show that the Minneapolis Teachers Fund will be depleted by the year

2011 unless action is taken to correct the contribution deficiency. Without corrective action, there will be no money available for benefit payments to retirees or survivors.

The asset projection for St. Paul Teachers shows a downturn after the year 2008 if the contribution deficiency is allowed to continue. Although not nearly as serious as the Minneapolis Teachers solvency issue, the potential downturn suggests a problem that should be addressed before it becomes more difficult and costly to resolve.

Section 4: A Five Year Review

Membership

The plans discussed in this report had more than 236,000 active members and paid out benefits to more than 72,000 annuitants on July 1, 1990.

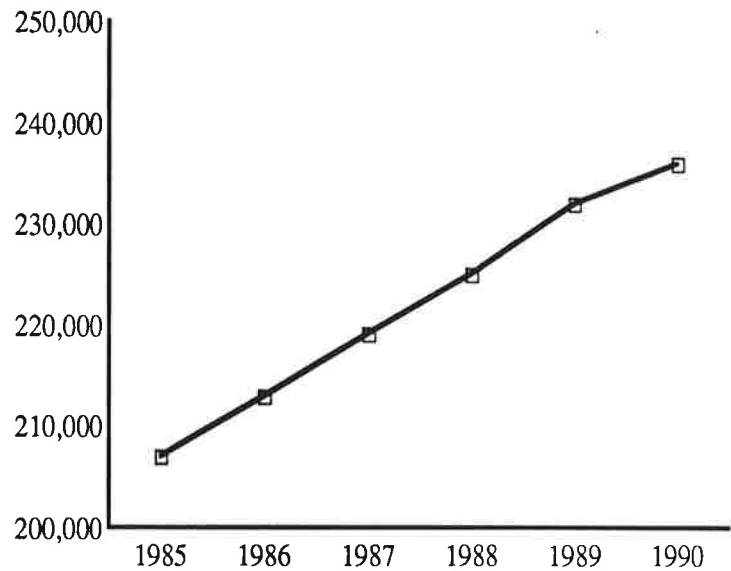
The three large state-wide funds dominate the group with 91 percent of the active members and 83 percent of the annuitants.

In 1985, there were about 28 annuitants for every 100 active members. Today there are close to 31 annuitants for every 100 active members. The growth in active membership had been consistent until a slowdown occurred in 1990. Annuitant growth, on the other hand, has been less consistent. We believe the slower growth from 1988 to 1989 represents:

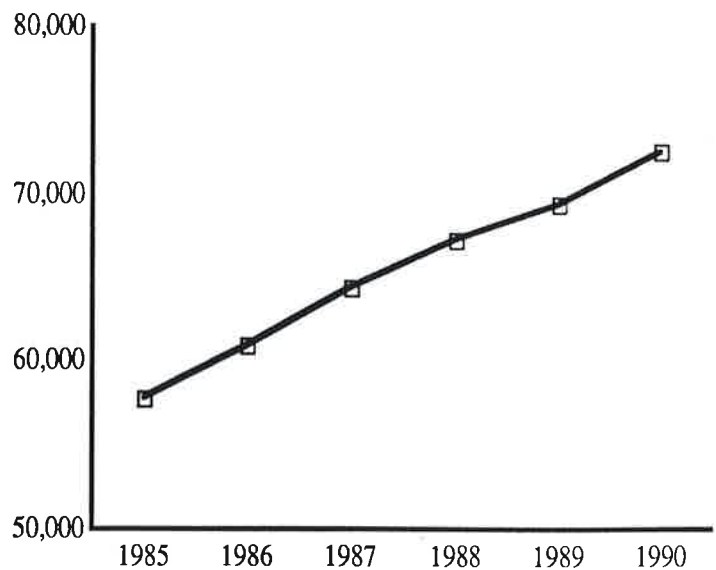
- ▼ the speed at which retirements occurred during the earlier years when the Rule of 85 was in place, and
- ▼ the deferral of retirements as members evaluated the 1989 benefit changes.

A review of the individual plans shows that only plans closed to new members had a decrease in active membership. Those same two plans — Minneapolis Employees and Police and Fire Consolidation — are the only ones where the number of annuitants exceeds the number of active employees.

Active Members



Annuitants



Membership By Plan

Plan	Active Members		Annuitants	
	1990	5-Year Change	1990	5-Year Change
Public Employees	102,664	19%	29,436	35%
State Teachers	64,324	10	17,319	25
State Employees	49,576	12	13,385	18
PERA P&F	6,136	25	1,493	36
St. Paul Teachers	3,343	16	1,270	15
Minneapolis Teachers	3,252	18	2,498	7
Minneapolis Employees	2,730	(28)	4,888	5
Duluth Teachers	1,553	31	674	14
Correctional Employees	1,416	19	364	11
State Patrol	788	3	465	14
P&F Consolidation	287	NA	393	NA
Judges	262	9	178	28
Legislators	201	0	163	9
Elective State Officers	6	0	8	(11)
All Plans	236,538	14%	72,534	26%

Funded Percentages

Over the 5 year period, the funded percentage has improved from 67% to 76%.

Liabilities have increased 67% from \$10.6 billion to \$17.6 billion. Assets have increased 90%, from \$7.0 billion to \$13.3 billion.

Funded percentages are affected by four major forces:

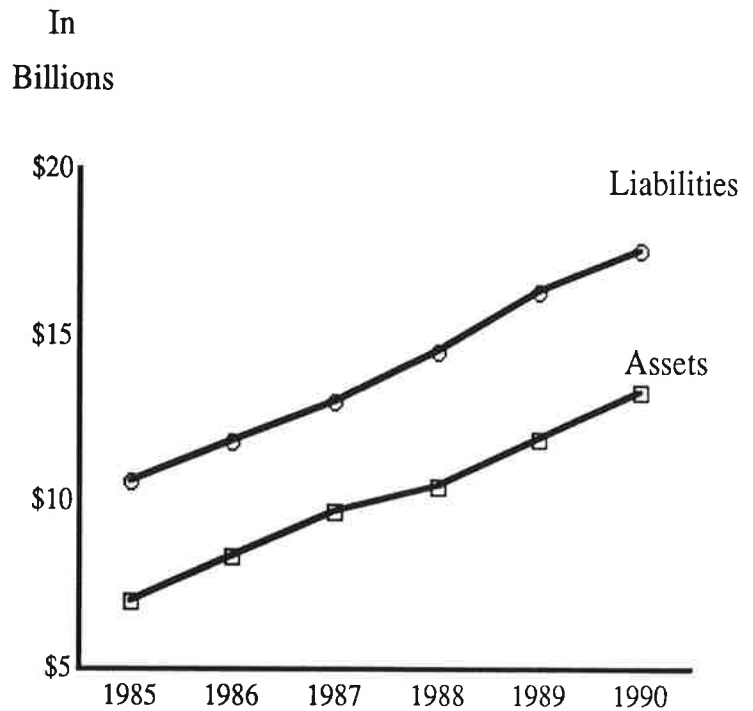
- ▼ Contribution adequacy.
- ▼ Actuarial gains and losses.
- ▼ Benefit changes.
- ▼ Assumption changes.

A plan with a contribution sufficiency will amortize the unfunded liability prior to the scheduled amortization date. The greater the sufficiency, the faster the funded percentage increases. A contribution deficiency has the opposite effect.

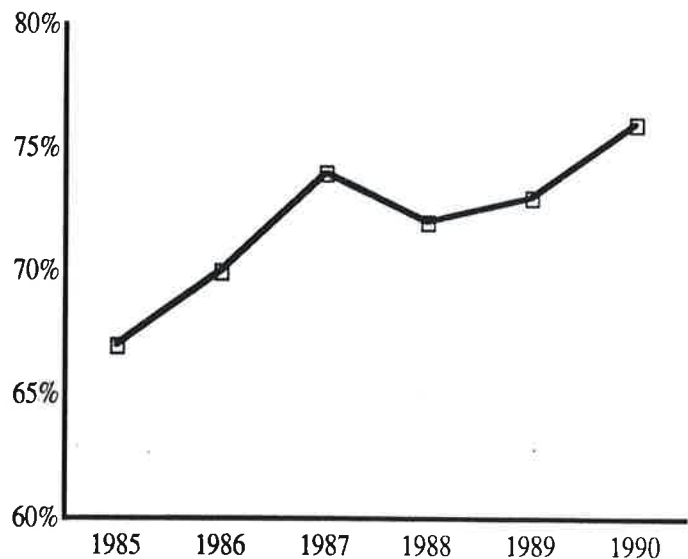
Actuarial gains and losses measure the liabilities based on actual experience compared to what had been expected. An actuarial loss means that more liabilities have to be funded than had been anticipated. An example of an actuarial loss is when salary increases are greater than the assumed increase.

Benefit changes almost always represent an improvement in benefits and therefore, represent additional liability that needs to be funded.

Liabilities vs. Assets



Funded Percentage



Actuarial assumption changes are made when the assumptions are not adequately predicting experience over a reasonable period of years. For example, the assumed ages at retirement could be either too high or too low. Thus, assumption changes can produce increases or decreases in liabilities.

The funded percentage does not increase uniformly from year to year. The dip in the percentage for 1988 reflects unfavorable experience because this was the only year during the period that investments did not earn the expected rate of return and salaries increased faster than expected. The 1989 funded percentage was impacted by major benefit improvements as well as assumption changes.

The following table shows the relative influence of actuarial gains and losses, benefit changes and assumption changes for the period 1985 to 1990.

**Annual Impact on Unfunded Liabilities
In Millions of Dollars**

	<u>Experience</u>	<u>Benefits</u>	<u>Assumptions</u>
1985-86	\$ (138)	\$ 24	\$ 0
1986-87	(321)	25	117
1987-88	320	2	250
1988-89	(175)	777	(329)
1989-90	(211)	0	(74)

Funded Percentage by Plan

<u>Plan</u>	<u>1985</u>	<u>1990</u>	<u>Change In Funded Percentage</u>
PERA P&F	88 %	105 %	17
Correctional Employees	91	95	4
Duluth Teachers	76	94	18
State Patrol	75	90	15
State Employees	75	78	3
State Teachers	62	78	16
Minneapolis Employees	67	76	9
Public Employees	71	72	1
P&F Consolidation	NA	71	NA
St. Paul Teachers	52	64	12
Minneapolis Teachers	49	50	1
Legislators	46	41	(5)
Judges	30	41	11
Elective State Officers	11	15	4
All Plans	67 %	76 %	9

A review of the individual plans over the 5 year period shows significant differences in the annual changes in their funded percentages. Even the three major state-wide plans have experienced considerable differences in actuarial gains and losses, benefit changes and assumption changes.

Impact on Unfunded Liabilities, 1985-90 In Millions of Dollars

	<u>Public Employees</u>	<u>State Teachers</u>	<u>State Employees</u>
Experience	\$ 74	\$ (351)	\$ (79)
Benefits	155	295	237
Assumptions	166	(225)	11

Appendix A: Characteristics of the Plans

Plan	New Members	Basic/ Coordinated	Post Retirement	Statutory Employer Contributions
State Employees	Yes	No	MPRIF*	Set Percentage
Correctional	Yes	No	MPRIF	Set Percentage
State Patrol	Yes	No	MPRIF	Set Percentage
Judges	Yes	Yes	MPRIF	As Needed
Legislators	Yes	No	MPRIF	As Needed
Elective Officers	Yes	No	Other	As Needed
Public Employees	Yes	Yes	MPRIF	Set Percentage
PERA P & F	Yes	No	MPRIF	Set Percentage
Consolidation	No	No	MPRIF/Other	Actuarial
MERF	No	No	RBF**	Actuarial
State Teachers	Yes	Yes	MPRIF	Set Percentage
Mpls Teachers	Yes	Yes	Other	Set Percentage
St. Paul Teachers	Yes	Yes	Other	Set Percentage
Duluth Teachers	Yes	No	Other	Set Percentage

* Minnesota Post Retirement Investment Fund

** Retirement Benefit Fund

Any analysis of the 14 pension plans discussed in this report should recognize that these plans are not uniform. The primary differences among the plans can be described using four criteria:

1. Is the plan open to new members?

All but two of the plans — Minneapolis Employees and the Police and Fire Consolidation — are open to new members.

The total membership in the Police and Fire Consolidation Plan will increase whenever additional local relief associations consolidate. However, those relief associations are closed to new active members, and all new hires in those cities join the PERA Police and Fire Plan. New hires in Minneapolis join the Public Employees Retirement Association.

- 2. Are any of the active members accruing the higher amounts of basic benefits because they are not covered under Social Security?**

Five of the plans continue to have members earning basic benefits. The portion of basic members in the Public Employees, State Teachers and Judges Plans is insignificant.

- 3. Does the plan transfer money to a separately managed account upon retirement?**

Eight of the plans participate in the Minnesota Post Retirement Investment Fund(MPRIF). Members of the Police and Fire Consolidation Plan who elect PERA benefits also participate in the MPRIF. Of the remaining plans, only Minneapolis Employees has a separate fund for annuitants.

- 4. What are the statutory requirements for employer contributions?**

Nine of the plans require the employer to contribute a set percentage of salary. The two funds that are closed to new members require not only a set percentage of salary contribution, but also an adjustment for amortizing the unfunded liabilities in an amount determined by the actuarial valuation.

Three of the plans — Judges, Legislators, and Elective State Officers — require employer contributions as needed to either set up a reserve in the MPRIF, or to pay benefits as they become due. These are the only plans that do not prefund the pension obligation.

Appendix B: Actuarial Assumptions

Salary Increase	6.5%	6.5%	3.5%	6.5%
Interest Rate				
Pre-Retirement	8.5%	8.5%	5.0%	8.5%
Post-Retirement	5.0%	8.5%	5.0%	8.5%/5.0%
Amortization Date	2020	2020	2017	2010
	Public Employees State Teachers State Employees PERA P&F Correctional State Patrol Judges Legislators Elective Officers	Mpls Teachers St. Paul Teachers Duluth Teachers	Mpls Employees	Consolidation

The purpose of an actuarial valuation is to establish an appropriate rate of funding for benefits that may not be payable until a date many years in the future. This process requires being able to determine the value of future benefits to be paid to current members. Such determinations require assumptions about future events.

Assumptions may be categorized as economic assumptions or demographic assumptions. The primary economic assumptions which are

shown in the table are established by Minnesota Statutes and have a very significant effect on the calculation of actuarial liabilities.

The demographic assumptions, while also important, have a lesser effect on the calculation of actuarial liabilities and are concerned with such factors as when members retire and how long they can be expected to live. These demographic assumptions vary by individual plan and are adjusted based on experience studies.

Appendix C: Definition of Terms

Actuarial Accrued Liability - Please refer to the entry age normal actuarial cost method.

Assets - The current assets is the statutory definition of asset value used by the actuary in calculating the unfunded actuarial accrued liability. The current asset value is based on the cost value of the assets, plus one-third of the amount of unrealized gains and losses. For those plans that transfer funds upon retirement to a post retirement fund, the current asset value for the post retirement fund portion is the value of the liability based on the current benefit level and a 5% interest rate.

Entry Age Normal Actuarial Cost Method - This is the actuarial method used to calculate the required contribution. This method funds benefits for each individual member by contributions that are a level percentage of the member's salary from the actual date of entry into the plan until the expected date of retirement. Each year a contribution is determined by applying this percentage to the member's salary and the resulting amount is referred to as the normal cost for that year.

The accumulation of previous years' normal costs for active members, along with the liability for any benefit promises made to annuitants and other terminated employees is referred to as the actuarial accrued liability.

Minnesota Post Retirement Investment Fund (MPRIF) - This is a fund managed by the State Board of Investments that holds reserves for retired members and survivors currently receiving benefits. Transfers are made assuming that MPRIF will earn 5% per year in the future. If earnings are in excess of 5%, then permanent benefit increases will be provided to retired members.

Normal Cost - Please refer to the entry age normal actuarial cost method.

Retirement Benefit Fund (RBF) - This is a fund that operates just like the MPRIF, but is established only for Minneapolis Employees and is managed by MERF.

Supplemental Contribution - Supplemental Contribution is the actuarially computed amount to be paid during a given year for the purpose of paying off the unfunded liability. For those funds open to new members, this amortization payment is expressed as a level percentage of payroll to the amortization date. Thus, as payroll increases, so will the dollar amount of contribution to amortize the unfunded. For the two funds closed to new members, the rate of funding is expressed as a level dollar amount each year, rather than a level percentage of payroll.

Unfunded Liability - The excess of the actuarial accrued liability over the assets.