



**NORTH DAKOTA
RETIREMENT AND
INVESTMENT OFFICE**

*Teachers' Fund for Retirement
State Investment Board*

*Actuarial Experience Study
For The Five-Year Period
Ending June 30, 1999*





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March 23, 2000

Board of Trustees
North Dakota Teachers'
Fund for Retirement
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Dear Members of the Board:

Results of 1999 Actuarial Experience Study

We are pleased to present the results of the 1999 Actuarial Experience Study of TFFR. It includes a discussion of experience during the last five years, it presents our recommendations for new actuarial assumptions and methods, and it provides information about the actuarial impact of these recommendations on the margin and other key actuarial measures.

We wish to thank your staff for their assistance in this project.

With the Board's approval of the recommendations in this report, we believe the actuarial condition of the System will be more accurately portrayed.

Sincerely,

A handwritten signature in cursive script that reads 'W. Michael Carter'.

W. Michael Carter
Vice President

A handwritten signature in cursive script that reads 'J. Christian Conradi'.

J. Christian Conradi
Actuary

nlb

Enclosures

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SECTION I
INTRODUCTION



Section I

Introduction

In determining liabilities, contribution rates and funding periods for retirement plans, actuaries must make assumptions about the future. Among the assumptions that must be made are:

- Retirement rates
- Mortality rates
- Turnover rates
- Disability rates
- Investment return rate
- Salary increase rates

For some of these assumptions, such as the mortality rates, past experience provides important evidence about the future. For other assumptions, such as the investment return rate, the link between past and future results is much weaker. In either case, though, actuaries should review their assumptions periodically and determine whether these assumptions are consistent with actual past experience and with anticipated future experience.

For this purpose, therefore, we have reviewed and analyzed TFFR's data for the period from June 30, 1994, through June 30, 1999. In our view, performing such experience reviews on a five-year interval is reasonable. Sufficient data can be gathered over a five-year period so that the results have statistical significance. Legislation, such as plan improvements or changes in statewide salary schedules, can sometimes affect the results; using a five-year period prevents giving too much weight to such short-term effects. Using a much longer period, on the other hand, could water down real changes that may be occurring, such as mortality improvement or a change in the ages at which teachers retire.

In an experience study, we first determine the number of deaths, retirements, etc. that occurred during the period. Then we determine the number that were expected, based on the current actuarial assumptions. Finally we calculate the A/E ratio, where "A" is the actual number (of retirements, for example) and "E" is the expected number. If the current assumptions were "perfect", the A/E ratio would be 100.0%. When it varies much from this figure, it is a sign that new assumptions may be needed.



Of course we not only look at the assumptions as a whole, but we also review how well they fit the actual results by sex, by age, and by service.

Finally, the actuary "graduates" or smoothes the results, since the raw results can be quite uneven from age to age or from service to service.



SECTION II

ANALYSIS OF EXPERIENCE AND RECOMMENDATIONS



Section II

Analysis of Experience and Recommendations

The assumed inflation rate underlies both the investment return assumption and the salary increase assumption. Therefore, we will deal with it first. Then we will cover the other economic assumptions (the investment return rate and the salary increase rates). Next, we will discuss the demographic assumptions (mortality, disability, termination and retirement). Finally, we will cover the actuarial methods being used.

Inflation rate

The current inflation assumption, set at the time of the last experience study, is 4.00%. However, it is clear that we are currently in a period of relatively low inflation.

Over the five-year period ending June 1999, the CPI-U has increased at an average annual rate of 2.3%, while it increased an average of 3.0% per year over the ten years ending in June 1999. The CPI-U increases for each of the last five years are as follows:

1994/1995	3.0%
1995/1996	2.8%
1996/1997	2.3%
1997/1998	1.7%
1998/1999	2.0%

Because of the lower inflation being experienced, we recommend that the assumed inflation rate be decreased to 3.0%.

Investment return rate

Currently, we assume that future investment returns will average 8.00%, and we are recommending that this assumption be left unchanged. However, in the last experience study, our assumption was based on an assumed 4.00% inflation rate and an assumed 4.00% real rate of return (return above inflation). This time, the 8.00% return is composed of a 3.00% inflation rate and a 5.00% real rate of return.



Over the last ten years, TFFR has averaged an 11.4% return on assets. However, past performance, even averaged over a five- or ten-year period, is not a reliable indicator of future performance. The asset allocation of the trust will impact the overall performance, so returns achieved under a different allocation are not meaningful. More significantly, though, the real rates of return for many asset classes, especially equities, vary so dramatically from year to year that even a ten-year period may not be long enough to provide reasonable guidance. For most of the last ten years, real returns on equities have been at historical highs.

We have developed the real return assumption by using the current target asset allocation for the fund and using assumptions about average real rates of return, that will form the basis of the asset/liability model. As shown below, this produces a 5.74% assumed real rate of return. To this expected real rate of return, we add expected inflation — 3.00% as discussed above. Next, we subtract 50 basis points as an offset for the effect of administrative and investment expenses, since the return assumption represents net return after payment of all expenses. This reduces the nominal expected return to 8.24%. We have then chosen to set our actual investment return assumption at 8.00%, to introduce a small measure of conservatism.

Asset Class	Assumed Real Return Rates by Class	Target Allocation	Real Return by Class
(1)	(2)	(3)	(4)
Domestic Equities - Large cap	6.50%	25%	1.63%
Domestic Equities - Small cap	6.60%	10%	0.66%
International Equities (EAFE)	6.10%	15%	0.92%
Emerging Markets Equities	6.50%	5%	0.33%
Domestic Fixed Income	4.40%	18%	0.79%
International Fixed Income	3.90%	5%	0.20%
High Yield Bonds	6.40%	5%	0.32%
Real Estate	4.50%	10%	0.45%
Alternative Investments	7.70%	5%	0.39%
Cash Equivalents	2.50%	2%	0.05%
Total real return		100%	5.74%
Plus: assumed inflation			3.00%
Expected return			8.74%

You should note that 8.00% is still the most common investment return assumption used by public pension plans.



Salary increase rates

The average pay increase for members active in both valuations are as follows:

1994/1995	4.2%
1995/1996	5.0%
1996/1997	4.4%
1997/1998	4.9%
1998/1999	5.5%

The geometric average of these is 4.8%.

However, salary increases are much larger for shorter-service employees than longer-service employees. Therefore, we have recommended the adoption of assumed salary increase rates which vary by service.

To determine the new rates, we first determined the average increase over the five-year period for members grouped by service. Next, we backed out the inflation during the period, arriving at the real rates of increase. Finally, we added back our assumed 3.00% inflation rate to arrive at the recommended rates. These new rates include an increase of 13.00% for new members after their first year of service, grading down to a 4.00% increase for members with 15 or more years of service. The full schedule is shown in Section V.

Overall, the change had almost no impact. The average expected salary increase for all members is 5.3%, based on the current assumption, and it remains 5.3% using the new recommended assumption. (This 5.3% average expected increase is larger than the actual average increase of 4.8% during the last five years principally because of the difference between actual inflation during this period and our 3.00% assumption going forward.)

Post-retirement mortality

The mortality tables currently being used for non-disabled retirees and for beneficiaries receiving benefits are the 1983 Group Annuity Mortality tables (without margins) for males and females. These tables are then adjusted by using a two-year setback for males and a three-year setback for females.



When we reviewed the mortality experience for non-disabled retirees, we found that mortality rates had decreased somewhat over the last five years, especially for males. During the five-year period, the actual number of deaths among retirees (excluding disabled retirees) and beneficiaries was 840 (204 males and 636 females).

For males, the actual to expected (A/E) ratio was only 91.7%. That is, we had fewer deaths than expected, so we were underestimating the plan's liability for male annuitants. On the other hand, the A/E ratio for females was 107.5%. We prefer to set the mortality assumption so that the A/E ratio will be about 110%. This allows some margin for future mortality improvement. Therefore, we recommend changing the mortality table for non-disabled retirees to the 1994 Uninsured Pensioner Mortality Table for males and females, set back two years for males and three years for females. This produces an A/E ratio of 109.9% for males and 112.7% for females.

We also looked at mortality among the disabled retirees, but there were only nine deaths in this group. This is far too few to use in setting assumptions, so we recommend no change from the table currently being used. This is a published table derived from Social Security experience and used by the Pension Benefit Guaranty Corporation.

Active mortality

Although the mortality assumption for active members can differ from the assumption for retired members, our recommendation in this case is to use the same tables for both purposes. There were only 45 active member deaths during the five-year period, and this is too few to justify establishing a separate assumption.

Disability

There were 46 members approved for a disability benefit during the five-year period. Again this is too few to provide much useful information. However, the A/E ratio using our current assumption was 159% for males and females combined. That is, there were about 60% more disabilities than anticipated by our assumption. Therefore, we are recommending that the current rates be increased by 60% at all ages.



Termination

Termination rates reflect members who leave for any reason other than death, disability or service retirement. They apply whether the termination is voluntary or involuntary, and whether the member takes a refund or keeps his/her account balance on deposit in the Fund. We are currently using separate tables for males and females. These tables are a function of both age and service. I.e., a female member age 35 with two years of service is expected to have a higher probability of termination than a female age 35 with eight years of service.

The current assumptions in the aggregate produce an A/E ratio for males of 94% for males and 88% for females. This would normally suggest that the rates were too high, and therefore understate the liability. This is because the current rates would predict that too many employees were terminating and receiving a refund, rather than remaining in service and receiving a retirement benefit. However, when we looked at results just for members with ten or more years of service—the members with most of the liability—we found that the A/E ratios were about 110-112% for males and females. Therefore, we decided that on balance the current tables were reasonable, and we are recommending no changes.

Retirement rates

We currently use rates of retirement that vary by age, sex and type of retirement (reduced or unreduced). Our analysis showed about 850 retirees during the five-year period. However, some of these are previously terminated members who are only now starting to draw their benefits. We adjusted our analysis to account for these, and we estimated the number of retirements who were not on the June 1999 payroll but would later appear with a May or June retirement date (the in-process retirees).

Because of the change in the reduction factors for reduced retirement, effective on July 1, 1999, it would not have been helpful to compare actual experience with our assumption. In 1999, we modified the previous rates for reduced retirement based on our judgement about the impact of the change in the reduction factors. We see no reason to change these rates.



For unreduced retirement, the A/E ratios based on current tables were 123% for males and 110% for females. Therefore, the current assumptions are understating the number of retirements. Further, the average age at retirement was 0.6-0.9 years younger than expected. We also observed that actual rates of retirement were much heavier than expected when employees were first eligible for retirement. I.e., for any given age/sex, the proportion of those who have just met the rule of 85 and then retired is much heavier than the proportion of those who met the rule of 85 one or more years ago. This is a common pattern, and we decided that it was worth taking account of this phenomenon in our assumptions.

Therefore, we modified the rates for unreduced retirement to include a rate that applies when the members are first eligible (points equal 85 or 86) and a separate rate that applies thereafter. These rates are shown in Section V. The new assumptions produce a better match of the actual and expected retirement ages, and they produce A/E ratios of 95% for males and 100% for females.

Other assumptions

There are other assumptions made in the course of a valuation, such as the percentage of members who are married, the age difference between husbands and wives, the likelihood that a terminating employee will take a refund, etc. We reviewed these, and decided to recommend no changes to these other assumptions.

Actuarial Cost Method

Although the actual contribution to TFFR is fixed by statute, we use the Entry Age actuarial funding cost method to determine the 20-year funding cost that is used as a "bogey" in determining the margin. The Entry Age method will generally produce relatively level contribution rates from year to year, and allocates costs among various generations of taxpayers in a reasonable fashion. It is far and away the most used actuarial cost method among statewide pension funds, and we recommend continuing to use this method.



New Entrant Profile

Under the particular version of the Entry Age actuarial funding method used for TFFR, we compute the normal cost for the plan based on a hypothetical population of new members. The population adopted during the last experience study was based on the age/sex/pay distribution of actual new members who joined TFFR during the 1994 fiscal year. We have updated this hypothetical population to reflect the actual distribution of new members who joined TFFR during the 1999 fiscal year. We recommend changing to this updated "profile" of new members.

Actuarial Value of Assets

Actuaries generally recommend using a smoothed actuarial value of assets (AVA), rather than market value (MVA), in order to dampen the fluctuations in measurements such as the margin and the funded status. The current method smoothes all realized and unrealized gains over a five-year period. As of June 30, 1999, the AVA was 83.4% of the MVA.

Although this method is reasonable, we are recommending a change to a different five-year smoothing method—one that smoothes the differences between total return, net of investment and administrative expenses, and expected return based on the 8.00% investment return rate assumption.

There are two major reasons for our recommendation: (i) the current method produces different AVA's depending on how the investments are structured, and (ii) the current method has a bias towards understating the MVA.

The current method smoothes realized and unrealized gains and losses, but it does not smooth interest or dividend income. I.e., the method fully and immediately recognizes each year's revenue from contributions, interest and dividends, reduced by refunds, benefit payments and expenses. It also recognizes 20% of the realized and unrealized gains and losses during the last five years. For example, if your actual return in a given year is 12%, you smooth the difference between 12% and your return on interest and dividends. But the interest-and-dividend yield has been less than 3% recently, so less than 3% is recognized immediately, and the other 9+% is spread over five years.



On the other hand, the proposed method does not distinguish between types of return (interest, dividends, realized gains/losses, and unrealized gains/losses). It simply determines the expected return, based on the 8.00% investment return rate assumption. Then any actual return over or under this "bogey" is smoothed. If actual return is 12%, then 8% is reflected immediately in the AVA, and the other 4% is recognized in 20% increments over five years.

The current method treats different asset classes and different investment styles differently. From an AVA viewpoint, high yield bonds are treated more favorably than regular bonds, since more of their return comes from interest payments. Both classes of bonds are treated more favorably than stocks, and the value manager or the large cap manager has a more immediate impact on the AVA than a growth manager or a small cap manager.

Further, the current method smoothes more heavily than the proposed method, and has a bias towards understating the market. I.e., even when the fund returns exactly 8% year after year, if only 3% of the return comes from interest and dividends, the AVA will be less than the MVA. Under the proposed method, if the fund earns 8% every year, AVA will equal MVA.

Both methods are in fairly wide use among statewide pension systems.



SECTION III

**ACTUARIAL IMPACT
OF RECOMMENDATIONS**



Section III

Actuarial Impact of Recommendations

Shown below is a table that compares key results from the July 1, 1999 actuarial valuation with these same results redetermined using the recommended actuarial assumptions and methods. We have shown the impact of the recommended new assumptions with and without the change in the current method for computing the actuarial value of assets (AVA). As you can see, the assumption changes by themselves produce a decrease of 60 basis points in the margin. When the new actuarial asset valuation method is taken into account, though, the result is a net increase in the margin of 242 basis points.

	Current Assumptions and Methods	Recommended Assumptions but with Current AVA Method	Recommended Assumptions and Proposed AVA Method
Normal cost	9.82%	9.82%	9.82%
UAAL	135.3 million	155.6 million	53.7 million
Funding period	10.5 years	13.2 years	3.2 years
20-Year Funding Rate	6.09%	6.69%	3.67%
Margin	1.66%	1.06%	4.08%

The UAAL is the unfunded actuarial accrued liability. This is the portion of the total actuarial present value of future benefits that is assigned to past years. The funding period is the number of years that will be required to amortize the UAAL, assuming that the employer contribution rate remains at 7.75%, and assuming there are no gains, losses, benefit changes, assumption changes, etc. The amortization calculations are made assuming level payments. I.e., future payroll growth is ignored. The 20-year funding rate is the Board's target rate. The margin is the excess (shortfall) between the actual employer contribution rate of 7.75% and the target rate.

The figures above were calculated as of July 1, 1999, using the same benefit provisions and the same member and financial data that were used to prepare the regular July 1, 1999 actuarial valuation report.



SECTION IV

SUMMARY OF RECOMMENDATIONS



Section IV

Summary of Recommendations

Our recommendations may be summarized as follows:

- Change the inflation rate from 4.00% to 3.00%.
- Leave the investment return rate unchanged at 8.00%. I.e., there would be an increase in the real rate of return from 4.00% to 5.00%.
- Change the salary increase assumption to the sum of (i) the 3.00% inflation assumption, (ii) an additional 1.00% assumed increase applied to all members, and (iii) a service-related increase applied to members with less than 15 years of service, as shown in Section V.
- Change the non-disabled mortality assumption to the rates in the 1994 Uninsured Pensioner Mortality Table, set back two years for males and three years for females.
- Increase the disability incidence rates by 60%.
- Make no change to the disabled mortality assumption.
- Make no change to the termination assumptions for males and females.
- Change the retirement rates to new tables as shown in Section V, with rates a function of sex, age and type of retirement (reduced or unreduced).
- Revise the age/sex/pay profile for new entrants – used to determine the normal cost – to one based on new members joining TFFR in the 1998-99 fiscal year.
- Change the method used to determine the actuarial value of assets from one that smoothes realized and unrealized gains and losses over five years to one that smoothes differences between actual and expected returns over five years, as described in Section V.



SECTION V

SUMMARY OF ASSUMPTIONS AND METHODS INCORPORATING THE RECOMMENDED ASSUMPTIONS



Section V

Summary of Assumptions and Methods Incorporating the Recommended Assumptions

ACTUARIAL ASSUMPTIONS

1. Investment Return Rate..... 8.00% per annum, compounded annually, composed of an assumed 3.00% inflation rate and a 5.00% real rate of return. (Adopted July 1, 1990; allocation between inflation and real rate of return modified July 1, 2000.)

2. Mortality Rates
 - a. Non-Disabled..... 1994 Uninsured Pensioner Mortality Table set back two years for males and three years for females. (Adopted July 1, 2000.)

 - b. Disabled..... Pension Benefit Guaranty Corporation Disabled Life Mortality Tables Va and VIa.

Age	Deaths per 100 Lives			
	Male Participants		Female Participants	
	Non-Disabled	Disabled	Non-Disabled	Disabled
20	.0392	4.83	.0177	2.63
25	.0471	4.83	.0236	2.63
30	.0602	3.62	.0315	2.37
35	.0815	2.78	.0431	2.14
40	.1154	2.82	.0595	2.09
45	.1905	3.22	.0861	2.24
50	.3487	3.83	.1374	2.57
55	.5778	4.82	.2165	2.95
60	.8577	6.03	.3448	3.31
65	1.3768	6.78	.5789	3.70
70	2.4699	7.39	.9646	4.11



3. Retirement Rates..... The following rates of retirement are assumed for members eligible to retire. (Adopted July 1, 2000.)

Retirements Per 100 Members

Age	Unreduced Retirement Ultimate Rate		Unreduced Retirement Initial Eligibility		Reduced Retirement	
	Male	Female	Male	Female	Male	Female
50	17.0%	10.0%	40.0%	35.0%	0.0%	0.0%
51	17.5%	10.0%	40.0%	35.0%	0.0%	0.0%
52	18.0%	10.0%	40.0%	35.0%	0.0%	0.0%
53	18.5%	10.0%	40.0%	35.0%	0.0%	0.0%
54	19.0%	10.0%	40.0%	35.0%	0.0%	0.0%
55	19.5%	10.0%	50.0%	55.0%	2.0%	3.0%
56	20.0%	15.0%	50.0%	55.0%	2.0%	3.0%
57	20.5%	15.0%	50.0%	55.0%	2.0%	3.0%
58	21.0%	15.0%	50.0%	55.0%	2.0%	3.0%
59	21.5%	17.5%	50.0%	55.0%	2.0%	3.0%
60	25.0%	20.0%	75.0%	75.0%	4.0%	3.0%
61	50.0%	25.0%	50.0%	75.0%	16.0%	4.0%
62	75.0%	40.0%	75.0%	75.0%	30.0%	50.0%
63	60.0%	40.0%	60.0%	75.0%	16.0%	20.0%
64	60.0%	50.0%	60.0%	75.0%	16.0%	20.0%
65	60.0%	60.0%	60.0%	60.0%	--	--
66	40.0%	40.0%	40.0%	40.0%	--	--
67	40.0%	40.0%	40.0%	40.0%	--	--
68	40.0%	40.0%	40.0%	40.0%	--	--
69	40.0%	40.0%	40.0%	40.0%	--	--
70	100.0%	100.0%	100.0%	100.0%	--	--



4. Disability Rates As shown below for selected ages. (Adopted July 1, 2000.)

<u>Age</u>	<u>Disabilities Per 100 Members</u>
20	0.016
25	0.016
30	0.016
35	0.016
40	0.048
45	0.080
50	0.128
55	0.224
60	0.432
65	0.000



5. Termination Rates.....The following withdrawal rates are used based on age.
 (For causes other than death, disability, or retirement.)
 (Adopted July 1, 1995.)

Males											
Years of Service											
Age	0	1	2	3	4	5	6	7	8	9	10+
25	0.1420	0.1379	0.1366	0.1339	0.1220	0.1067	0.0896	0.0878	0.0860	0.0842	0.0598
30	0.1416	0.1376	0.1363	0.1336	0.1210	0.1053	0.0907	0.0889	0.0871	0.0853	0.0470
35	0.1359	0.1321	0.1308	0.1282	0.1141	0.0988	0.0867	0.0849	0.0832	0.0815	0.0343
40	0.1317	0.1280	0.1267	0.1243	0.1074	0.0928	0.0824	0.0808	0.0791	0.0775	0.0252
45	0.1282	0.1246	0.1234	0.1210	0.1002	0.0868	0.0777	0.0761	0.0746	0.0730	0.0196
50	0.1246	0.1211	0.1199	0.1176	0.0916	0.0809	0.0725	0.0710	0.0696	0.0681	0.0188
55	0.1444	0.1403	0.1390	0.1362	0.0974	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
60	0.1588	0.1544	0.1529	0.1499	0.1071	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
65	0.1747	0.1698	0.1681	0.1648	0.1178	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Females											
Years of Service											
Age	0	1	2	3	4	5	6	7	8	9	10+
25	0.1654	0.1607	0.1592	0.1560	0.1307	0.1119	0.0952	0.0806	0.0790	0.0774	0.0352
30	0.1373	0.1334	0.1321	0.1295	0.1107	0.0964	0.0836	0.0738	0.0723	0.0708	0.0312
35	0.1143	0.1110	0.1100	0.1078	0.0926	0.0820	0.0732	0.0672	0.0658	0.0645	0.0275
40	0.0978	0.0951	0.0941	0.0923	0.0779	0.0695	0.0637	0.0607	0.0595	0.0583	0.0242
45	0.0910	0.0885	0.0876	0.0859	0.0686	0.0593	0.0553	0.0545	0.0535	0.0524	0.0220
50	0.0967	0.0940	0.0931	0.0912	0.0670	0.0519	0.0480	0.0484	0.0475	0.0465	0.0227
55	0.1455	0.1414	0.1400	0.1373	0.0742	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
60	0.1885	0.1831	0.1814	0.1778	0.0907	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
65	0.2498	0.2428	0.2404	0.2357	0.1167	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000



6. Salary Increase Rates Inflation rate of 3.00% plus productivity increase rate of 1.00%, plus step-rate/promotional increase as shown below. (Adopted July 1, 2000.)

<u>Years of Service</u>	<u>Annual Step-Rate/ Promotional Component</u>	<u>Annual Total Salary Increase</u>
0	9.00%	13.00%
1	4.00%	8.00%
2	3.50%	7.50%
3	3.00%	7.00%
4	2.75%	6.75%
5	2.50%	6.50%
6	2.25%	6.25%
7	2.25%	6.25%
8	2.00%	6.00%
9	1.75%	5.75%
10	1.50%	5.50%
11	1.25%	5.25%
12	1.00%	5.00%
13	0.75%	4.75%
14	0.50%	4.50%
15 or more	0.00%	4.00%

7. Percent Married..... For valuation purposes 75% of members are assumed to be married. Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger than their spouses. (Adopted July 1, 1992.)

8. Percent Electing a Deferred Termination Benefit Terminating members are assumed to elect the most valuable benefit at the time of termination. Termination benefits are assumed to commence at the first age at which unreduced benefits are available. (Adopted July 1, 1990.)

9. Provision for Expense The assumed investment return rate represents the anticipated net rate of return after payment of all administrative and investment expenses. (Adopted July 1, 1992.)



ASSET VALUATION METHOD

The actuarial value of assets is based on the market value of assets with a five-year phase-in of actual investment return in excess of (less than) expected investment income. Expected investment income is determined using the assumed investment return rate and the market value of assets (adjusted for receipts and disbursements during the year). The actual investment return for this purpose is determined net of all investment and administrative expenses.

ACTUARIAL COST METHOD

The funding period required to amortize the unfunded actuarial accrued liability (UAAL) is determined using the Entry Age Normal actuarial cost method. This method assigns the plan's total actuarial present value of future benefits to various periods. The actuarial accrued liability is assigned to years prior to the valuation, and the normal cost is assigned to the year following the valuation. The remaining costs are assigned to future years.

The normal cost is determined for a hypothetical group of new entrants, based on actual new entrants in the June 30, 1999 valuation. The actuarial accrued liability is the difference between the total present value of future benefits and the actuarial present value of future normal costs. The unfunded actuarial accrued liability (UAAL) is the excess of the actuarial accrued liability over the actuarial value of assets.

