

North Dakota Teachers' Fund for Retirement

Actuarial Valuation and Review as of
July 1, 2011

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Doc #5213101





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October 20, 2011

*Board of Trustees
North Dakota Teachers' Fund for Retirement
1930 Burnt Boat Drive P.O. Box 7100
Bismarck, ND 58507-7100*

Dear Trustees:

We certify that the information contained in this report is accurate and fairly presents the actuarial position of the North Dakota Teachers' Fund for Retirement (TFFR) as of July 1, 2011.

All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion the results presented also comply with the North Dakota Century Code, and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board (GASB). The undersigned are independent actuaries. All are Fellows of the Society of Actuaries, Enrolled Actuaries, and Members of the American Academy of Actuaries, and all are experienced in performing valuations for large public retirement systems. They all meet the Qualification Standards of the American Academy of Actuaries.

ACTUARIAL VALUATION

The primary purposes of the valuation report are to determine the adequacy of the current employer contribution rate, to describe the current financial condition of TFFR, and to analyze changes in TFFR's financial condition. In addition, the report provides information required by TFFR in connection with Governmental Accounting Standards Board Statement No. 25 (GASB 25), and it provides various summaries of the data. Valuations are prepared annually, as of July 1 of each year, the first day of TFFR's plan and fiscal year.

FINANCING OBJECTIVES

The member and employer contribution rates are established by statute. The member rate is set at 7.75%, and is scheduled to increase to 9.75% effective July 1, 2012, and to 11.75% effective July 1, 2014. The employer rate is at 8.75%, and is scheduled to increase to 10.75% effective July 1, 2012, and to 12.75% effective July 1, 2014. The total additional 4% member contribution rate and 4% employer contribution rate will remain in effect until TFFR is 90% funded on an actuarial basis. At that point, the employer and member contribution rates will revert to 7.75%.

The rates are intended to be sufficient to pay TFFR's normal cost and to amortize TFFR's unfunded actuarial accrued liability (UAAL) over a period of 30 years from the valuation date; although at any given time the statutory rates may be insufficient. A 30-year period is the maximum amortization period allowed by GASB 25 in computing the Annual Required Contribution. The 30-year period is in common use for public-sector plans and is considered reasonable by the actuary.

PROGRESS TOWARD REALIZATION OF FINANCING OBJECTIVES

In order to determine the adequacy of the 8.75% statutory employer contribution rate, it is compared to the GASB 25 Annual Required Contribution (ARC). The ARC is equal to the sum of (a) the employer normal cost rate, and (b) the level percentage of pay required to amortize the UAAL over a 30-year period. For this calculation, payroll is assumed to increase 3.25% per year. As of July 1, 2011, the ARC is 13.16%, increased from 12.79% last year. This is greater than the 8.75% rate currently required by law. The shortfall (the negative margin) between the rate mandated by law (8.75%) and the rate necessary to fund the UAAL in 30 years is -4.41%.

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) decreased from last year. The funded ratio at July 1, 2010 was 69.8%, while it is 66.3% as of July 1, 2011. Based on market values rather than actuarial values of assets, the funded ratio increased to 62.8%, compared to 54.5% last year.

The plan has a net asset loss of \$96 million from previous years that has not yet been recognized in the actuarial value of assets because of the five-year smoothing. This unrecognized asset loss is due to large market losses during FY 2008 and FY 2009. As this loss is recognized over the next two years, the ARC is expected to continue to increase and the funded ratio is expected to continue decreasing, assuming the plan earns 8.00% in the future. However, the 4% scheduled increases in the employer and member contribution rates (for a total of 8%) over the next three years will improve the funded status and reduce the ARC.

REPORTING CONSEQUENCES

TFFR is required to report in its Comprehensive Annual Financial Report (CAFR) for the current fiscal year ending June 30, 2011 that actual contributions received in FY 2011 were less than the ARC. The FY 2011 8.75% statutory rate was 68.4% of the 12.79% ARC determined by the last valuation. Next year, the CAFR for FY 2012 will show that the 8.75% statutory rate is only 66.5% of the 13.16% ARC. There are no other accounting consequences for the state or the other school districts that sponsor TFFR, since it is a cost-sharing, multiple-employer retirement system.

BENEFIT PROVISIONS

The actuarial valuation reflects the benefit and contribution provisions set forth in the North Dakota Century Code. These have changed from the prior year's valuation. Below are highlights of the changes in provisions:

1. The employer contribution rate increases from 8.75% to 10.75% effective July 1, 2012, and increases thereafter to 12.75% effective July 1, 2014. The member contribution rate increases from 7.75% to 9.75% effective July 1, 2012, and increases thereafter to 11.75% effective July 1, 2014. Employer and member contributions will be reset to 7.75% once the Fund reaches a 90% funded ratio, measured using the actuarial value of assets. Note that the increased contribution rates have no direct impact on the July 1, 2011 actuarial valuation, but will have an impact commencing with the July 1, 2012 valuation.
2. Current Tier 1 members who, as of June 30, 2013, are vested (at least 3 years of service), and at least age 55, OR whose sum of age and service is at least 65, are considered a Tier 1 Grandfathered member. Current Tier 1 members, who do not meet these criteria as of June 30, 2013, are considered a Tier 1 Non-grandfathered member.
3. Eligibility for normal and unreduced retirement benefits do not change for Tier 1 Grandfathered members. For Tier 1 Non-grandfathered and Tier 2 members, effective as of July 1, 2013, unreduced retirement benefits start when the member reaches age 65 and is vested (3 years for Tier 1 Non-grandfathered, 5 years for Tier 2); or if earlier, when the sum of the member's age and service is at least 90, with a minimum age of 60.
4. Early retirement benefits do not change for Tier 1 Grandfathered members. For Tier 1 Non-grandfathered and Tier 2 members, effective as of July 1, 2013, the normal retirement benefit will be reduced by 8% per year from the earlier of age 65, OR the age at which the sum of the member's age and service is at least 90, with a minimum age of 60.
5. Effective July 1, 2013, all members may retire on disability after a period of at least five years of service (rather than one year of service). The amount of the benefit is based on a 2% multiplier and actual service (rather than a minimum of 20 years of service in the current calculation).
6. Effective July 1, 2012, re-employed retirees are required to pay member contributions.
7. Effective August 1, 2011, beneficiary and death benefit provisions were updated, and the 60-month death payment benefit was removed.

ASSUMPTIONS AND METHODS

Actuarial assumptions and methods are set by the Board of Trustees, based upon recommendations made by the plan's actuary. On January 21, 2010, the Board adopted new assumptions, effective for the July 1, 2010 valuation. These actuarial assumptions and methods comply with the parameters for disclosure in GASB 25.

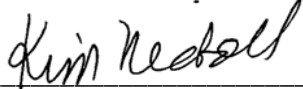
The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates, and funding periods.

DATA

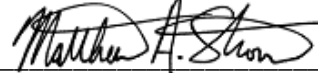
Member data for retired, active, and inactive participants was supplied as of July 1, 2011, by the staff of the Retirement and Investment Office (RIO). We have not subjected this data to any auditing procedures, but have examined the data for reasonableness and consistency with the prior year's data. Asset information was also supplied by the RIO staff.

Sincerely,

THE SEGAL COMPANY

By: 

Kim Nicholl, FSA, MAAA, EA
Senior Vice President and Actuary



Matthew A. Strom, FSA, MAAA, EA
Consulting Actuary

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SECTION 1: Valuation Summary for the North Dakota Teachers' Fund for Retirement

Significant Issues in the Valuation Year

1. The benefit and contribution changes adopted in 2011 and described on page 56 of this report are reflected in this valuation as described in the North Dakota Century Code.
2. The funding ratio based on the actuarial value of assets over the actuarial accrued liability as of July 1, 2011 is 66.3%, compared to 69.8% as of July 1, 2010. This ratio is a measure of funding status, and its history is a measure of funding progress, and is the ratio required to be reported under GASB 25.
3. The employer statutory contribution rate for the fiscal year beginning July 1, 2011 under the North Dakota Century Code is equal to 8.75% of payroll for employers compared to the annual required contribution of 13.16% of payroll. Therefore, the contribution deficiency is 4.41% of payroll as of July 1, 2011. Each year there is a contribution deficiency leads to an increased deficiency in all future years.
4. The 2011 legislative changes included increases to the statutory contribution rates: 2% each for employer and member effective July 1, 2012 and an additional 2% each for employer and member effective July 1, 2014. Employer and member contributions will be reset to 7.75% each once the Fund reaches a 90% funded ratio, measured using the actuarial value of assets. When including the total 8% increase in the statutory contribution rates and comparing that to the annual required contribution, there would no longer be a contribution deficiency.
5. For the year ended June 30, 2011, Segal has determined that the assets returned 23.5% on a market value basis. However, due to the gradual recognition of investment gains and losses under the actuarial smoothing method, the actuarial rate of return was 1.4%, compared to the assumed rate of 8%. As of June 30, 2011, the actuarial value of assets (\$1.823 billion) represented 105.6% of the market value (\$1.726 billion).
6. The portion of deferred investment gains and losses recognized during the calculation of the July 1, 2011 actuarial value of assets resulted in a loss of \$120,206,192.
7. As indicated on page 6 of this report, the total investment loss not yet recognized as of June 30, 2011 is \$96,419,554. This unrecognized loss will be recognized in the determination of the actuarial value of assets for funding purposes in the next few years, to the extent they are not offset by recognition of gains derived from future experience. This means that earning the assumed rate of investment return of 8% per year (net of investment expenses) on a market value basis will result in investment losses on the actuarial value of assets in the next few years.
8. As mentioned above, the current method used to determine the actuarial value of assets yields an amount that is 105.6% of the market value of assets as of June 30, 2011. Guidelines in Actuarial Standard of Practice No. 44 (Selection and Use of Asset Valuation Methods for Pension Valuations) recommend that asset values fall within a reasonable range around the corresponding market value. The actuarial asset method complies with these guidelines.

SECTION 1: Valuation Summary for the North Dakota Teachers' Fund for Retirement

9. The 1.4% return on the actuarial value of assets caused a \$120,206,192 loss in the unfunded actuarial liability, and demographic and liability experience resulted in a \$6,164,197 loss. The plan changes adopted in 2011, reduced the unfunded actuarial accrued liability by \$24,298,740.
10. This actuarial valuation report as of June 30, 2011 is based on financial data as of that date. Changes in the value of assets subsequent to that date, to the extent that they exist, are not reflected. Declines in asset values will increase the cost of the plan, while increases in asset values will decrease the cost of the plan.
11. The Fund's cash flow (contributions minus benefit payments, refunds, and expenses) as a percentage of the market value of assets is -2.7% as of June 30, 2011, an improvement over the -3.5% figure as of June 30, 2010. The scheduled increases in the employer and member contribution rates will further improve the cash flow percentage.

SECTION 1: Valuation Summary for the North Dakota Teachers' Fund for Retirement

Summary of Key Valuation Results

	2011	2010*
Demographic Data for Plan Year Beginning July 1:		
Number of retirees and beneficiaries	6,933	6,672
Number of inactive vested members	1,463	1,472
Number of inactive non-vested members	407	331
Number of active members	10,004	9,907
Total payroll supplied by System	\$488,764,292	\$465,007,110
Statutory Contributions (% of Payroll) for Plan Year Beginning July 1:		
Employer	8.75%	8.75%
Member	7.75%	7.75%
Assets:		
Market value	\$1,726,179,317	\$1,437,949,843
Actuarial value	1,822,598,871	1,841,960,219
Return on market value as determined by Segal	23.5%	13.9%
Return on actuarial value	1.4%	-0.5%
Ratio of actuarial value to market value	105.6%	128.1%
External cash flow %	-2.7%	-3.5%
Actuarial Information:		
Normal cost %	9.80%	10.57%
Normal cost	\$50,760,259	52,167,174
Actuarial accrued liability	2,749,751,755	2,637,165,045
Unfunded actuarial accrued liability	927,152,884	\$795,204,826
Funded ratio	66.3%	69.8%
Funding period	Infinite	Infinite
GASB 25 Information:		
Annual required employer contribution rate for year ending June 30	13.16%	12.79%
Margin	-4.41%	-4.04%
Gains/ (Losses):		
Asset experience	-\$120,206,192	-\$159,513,335
Liability experience	-6,164,197	-6,103,587
Benefit changes	24,298,740	0
Assumption/method changes	<u>0</u>	<u>-71,900,392</u>
Total	-\$102,071,649	-\$237,517,314

*2010 results are based on the valuation performed by Gabriel, Roeder, Smith & Co.

SECTION 2: Valuation Results for the North Dakota Teachers' Fund for Retirement

A. MEMBER DATA

The Actuarial Valuation and Review considers the number and demographic characteristics of covered participants, including active participants, inactive participants, retirees, and beneficiaries.

This section presents a summary of significant statistical data on these participant groups.

More detailed information for this valuation year and the preceding valuation can be found in Section 3, Exhibits A, B, and C.

A historical perspective of how the participant population has changed over the past ten valuations can be seen in this chart.

CHART 1
Member Population: 2002 – 2011

Year Ended June 30	Active Members	Inactive Vested Members	Inactive Non-vested Members	Retirees and Beneficiaries	Ratio of Actives to Retirees and Beneficiaries
2002	9,931	1,223	225	5,054	1.96
2003	9,916	1,276	233	5,177	1.92
2004	9,826	1,346	175	5,373	1.83
2005	9,801	1,377	168	5,586	1.75
2006	9,585	1,409	143	5,893	1.63
2007	9,599	1,439	142	6,077	1.58
2008	9,561	1,459	229	6,317	1.51
2009	9,707	1,490	292	6,466	1.50
2010	9,907	1,472	331	6,672	1.48
2011	10,004	1,463	407	6,933	1.44

SECTION 2: Valuation Results for the North Dakota Teachers' Fund for Retirement

Active Members

Plan costs are affected by the age, years of service and compensation of active members. In this year's valuation, there were 10,004 active members with an average age of 43.9 and 13.8 average years of service. The 9,907 active members in the prior valuation had an average age of 44.2 and 14.0 average years of service.

Inactive Members

In this year's valuation, there were 1,463 participants with a vested right to a deferred or immediate vested benefit.

In addition, there were 407 participants entitled to a return of their employee contributions.

These graphs show a distribution of active members by age and by years of service.

CHART 2
Distribution of Active Members by Age as of June 30, 2011

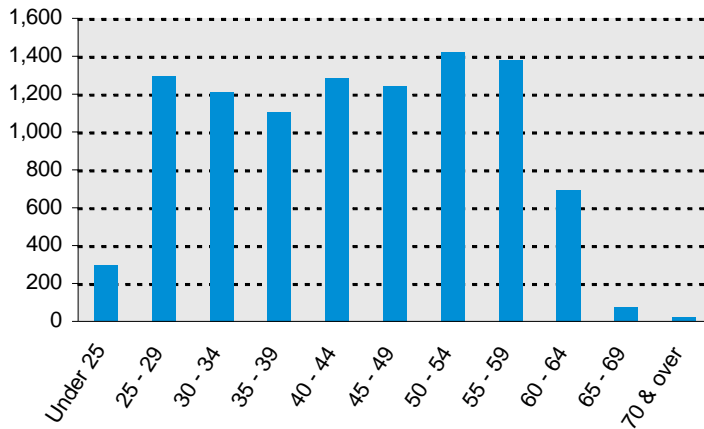
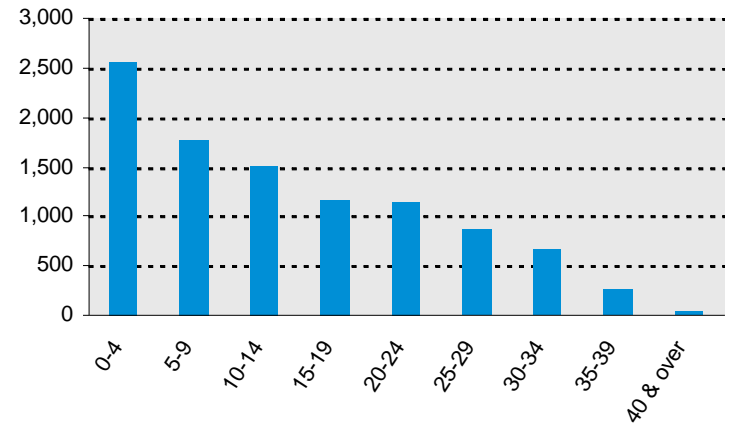


CHART 3
Distribution of Active Members by Years of Service as of June 30, 2011

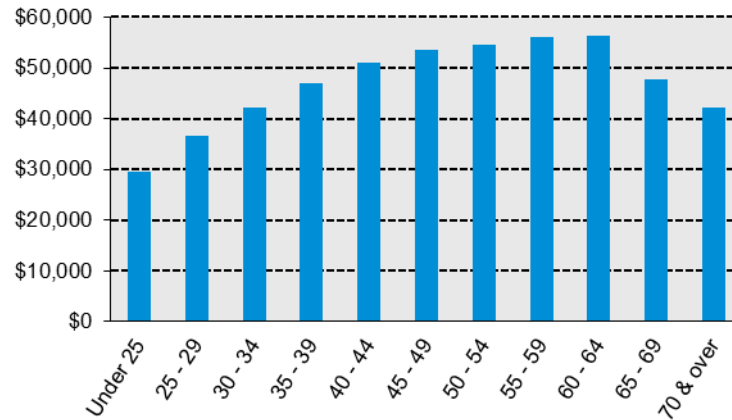


SECTION 2: Valuation Results for the North Dakota Teachers' Fund for Retirement

Distribution of Active Members by Age and Average Compensation

In this year's valuation, there were 10,004 active members with an average compensation of \$48,857. The 9,907 active members in the prior valuation had an average compensation of \$46,937.

CHART 4
Distribution of Active Members by Age and Average Compensation as of June 30, 2011



SECTION 2: Valuation Results for the North Dakota Teachers' Fund for Retirement

Retirees and Beneficiaries

As of June 30, 2011, 6,372 retirees and 561 beneficiaries were receiving total monthly benefits of \$11,134,239. For comparison, in the previous valuation, there were 6,140 retirees and 532 beneficiaries receiving monthly benefits of \$10,435,423.

CHART 5
Distribution of Retirees and Beneficiaries by Type and by Monthly Amount as of June 30, 2011

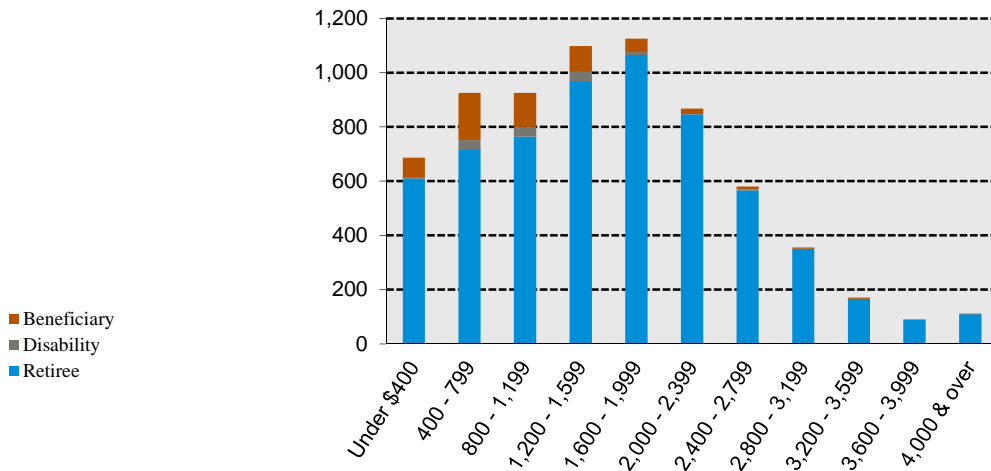
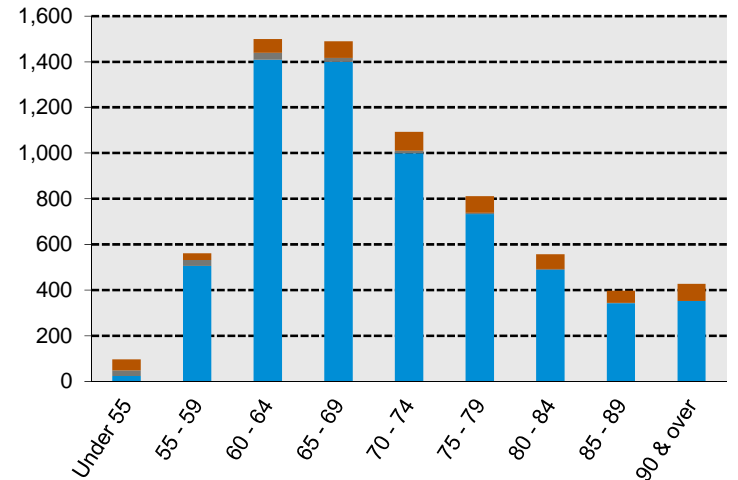


CHART 6
Distribution of Retirees and Beneficiaries by Type and by Age as of June 30, 2011



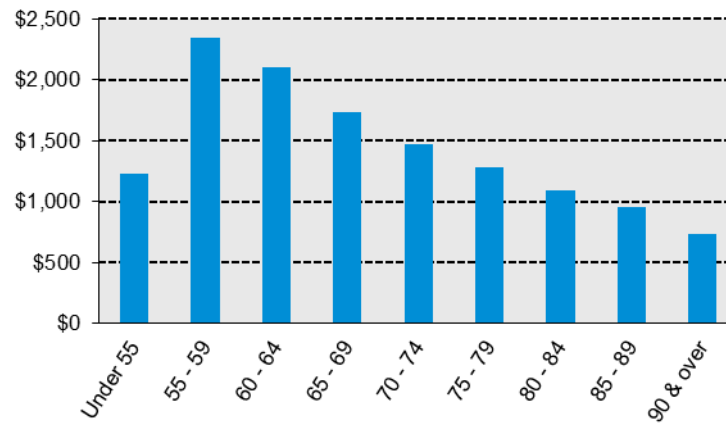
SECTION 2: Valuation Results for the North Dakota Teachers' Fund for Retirement

Distribution of Retirees and Beneficiaries by Age and by Monthly Benefit Amount

As of June 30, 2011, the average monthly benefit amount among 6,372 retirees and 561 beneficiaries was \$1,606. In the previous valuation, the average monthly benefit amount among 6,140 retirees and 532 beneficiaries was \$1,564.

CHART 7

Distribution of Retirees and Beneficiaries by Age and by Monthly Amount as of June 30, 2011



SECTION 2: Valuation Results for the North Dakota Teachers' Fund for Retirement

B. FINANCIAL INFORMATION

It is desirable to have level and predictable plan costs from one year to the next. For this reason, TFFR's Board utilizes an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable. The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

CHART 8

Determination of Actuarial Value of Assets for Years Ended June 30, 2011 and June 30, 2010

The chart shows the determination of the actuarial value of assets as of the valuation date.

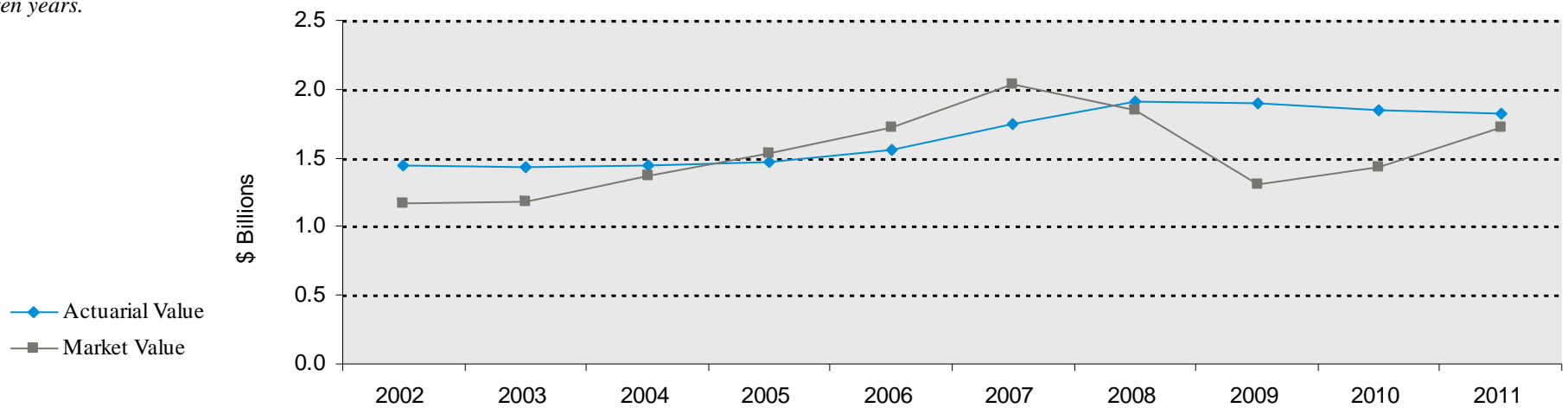
		2011		2010	
1.	Calculation of unrecognized return	<u>Original Amount</u>	<u>% Not Recognized</u>	<u>% Not Recognized</u>	
(a)	Year ended June 30, 2011	\$219,705,461	80%	\$175,764,369	--
(b)	Year ended June 30, 2010	74,336,281	60%	44,601,768	\$59,469,025
(c)	Year ended June 30, 2009	-640,460,510	40%	-256,184,204	-384,276,306
(d)	Year ended June 30, 2008	-303,007,436	20%	<u>-60,601,487</u>	-121,202,974
(e)	Year ended June 30, 2007	209,999,395			<u>41,999,879</u>
(f)	Total unrecognized return			-\$96,419,554	-\$404,010,376
2.	Market value of assets available for benefits			\$1,726,179,317	\$1,437,949,843
3.	Less: Unrecognized return			-\$96,419,554	-\$404,010,376
4.	Actuarial value of assets (Current Assets): (2) – (3)			<u>\$1,822,598,871</u>	<u>\$1,841,960,219</u>
5.	Actuarial value as a percent of market value			<u>105.6%</u>	<u>128.1%</u>

SECTION 2: Valuation Results for the North Dakota Teachers' Fund for Retirement

Both the actuarial value and market value of assets are representations of the TFFR's financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because the TFFR's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

This chart shows the change in the actuarial value of assets versus the market value over the past ten years.

CHART 9
Actuarial Value of Assets vs. Market Value of Assets as of June 30, 2002 – 2011



SECTION 2: Valuation Results for the North Dakota Teachers' Fund for Retirement

Investment Rate of Return

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the TFFR's investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets is 8.00%. The actual rate of return on an actuarial basis for the 2011 plan year was 1.39%.

Since the actual return for the year was less than the assumed return, the TFFR experienced an actuarial loss during the year ended June 30, 2011 with regard to its investments.

This chart shows the gain/(loss) due to investment experience.

CHART 10
Actuarial Value Investment Experience for Year Ended June 30, 2011

1. Actual return	\$25,361,703
2. Average value of assets	1,819,598,694
3. Actual rate of return: (1) ÷ (2)	1.39%
4. Assumed rate of return	8.00%
5. Expected return: (2) x (4)	\$145,567,895
6. Actuarial gain/(loss): (1) – (5)	<u>-\$120,206,192</u>

SECTION 2: Valuation Results for the North Dakota Teachers' Fund for Retirement

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the market value investment return for the last twenty years, including five-year, ten-year, fifteen-year and twenty-year averages.

Chart 11
Investment Return

Year Ended June 30	Market Value	Actuarial Value
1992	12.4%	6.5%
1993	14.7%	8.1%
1994	1.2%	7.0%
1995	13.6%	9.1%
1996	15.6%	11.3%
1997	18.5%	12.6%
1998	13.2%	12.6%
1999	11.5%	13.5%
2000	11.6%	13.3%
2001	-7.6%	8.6%
2002	-8.6%	3.0%
2003	2.1%	0.6%
2004	18.9%	1.9%
2005	13.3%	3.3%
2006	14.6%	8.5%
2007	20.4%	14.4%
2008	-7.0%	11.6%
2009	-27.0%	1.7%
2010	13.9%	-0.5%
2011	23.5%*	1.4%
Average Returns		
Last 5 years:	2.7%	5.3%
Last 10 years:	5.1%	4.5%
Last 15 years:	6.5%	7.0%
Last 20 years:	7.7%	7.3%

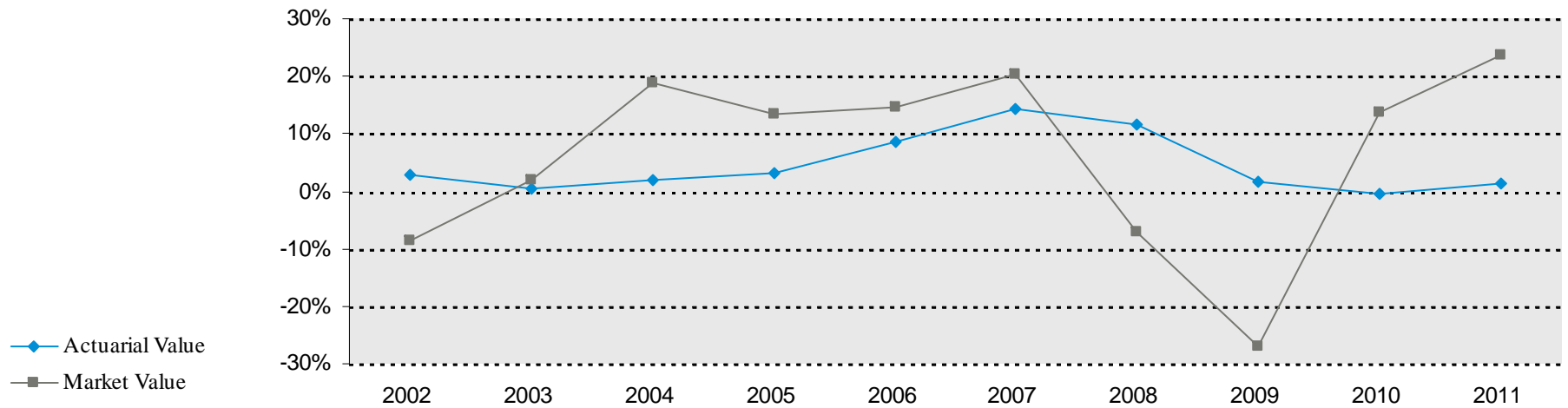
* As determined by Segal.

SECTION 2: Valuation Results for the North Dakota Teachers' Fund for Retirement

Subsection B described the actuarial asset valuation method that gradually takes into account fluctuations in the market value rate of return. The effect of this is to stabilize the actuarial rate of return, which contributes to leveling pension plan costs.

This chart illustrates how this leveling effect has actually worked over the years 2002 - 2011.

CHART 12
Market and Actuarial Rates of Return for Years Ended June 30, 2002 - 2011



SECTION 2: Valuation Results for the North Dakota Teachers' Fund for Retirement

Cash Flow

Cash flow is the difference between contributions and benefit payments, refunds, and expenses. Negative cash flow indicates that the payments made from the Fund exceed contributions made to the Fund.

Chart 13

History of Cash Flow

Year Ending June 30,	Disbursements or Expenditures				Total	External Cash Flow for the Year ²	Market Value of Assets	External Cash Flow as Percent of Market Value
	Contributions ¹	Benefit Payments	Refunds	Administrative Expenses				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2002	56,415,165	(67,482,482)	(2,743,408)	(1,066,309)	(71,292,199)	(14,877,034)	1,165,369,565	-1.3%
2003	60,210,068	(72,044,977)	(1,729,764)	(1,056,611)	(74,831,352)	(14,621,284)	1,175,258,478	-1.2%
2004	63,655,362	(77,153,054)	(5,800,100)	(1,513,788)	(84,466,942)	(20,811,580)	1,374,679,677	-1.5%
2005	64,072,881	(84,498,130)	(2,733,407)	(2,086,849)	(89,318,386)	(25,245,505)	1,530,194,427	-1.6%
2006	65,577,828	(91,818,092)	(2,697,308)	(1,484,591)	(95,999,991)	(30,422,163)	1,720,324,948	-1.8%
2007	66,362,099	(99,737,905)	(3,328,931)	(1,592,060)	(104,658,896)	(38,296,797)	2,029,777,412	-1.9%
2008	70,573,389	(106,456,334)	(5,500,476)	(1,639,521)	(113,596,331)	(43,022,942)	1,846,113,411	-2.3%
2009	74,380,980	(113,966,079)	(2,362,251)	(1,707,506)	(118,035,836)	(43,654,856)	1,309,716,730	-3.3%
2010	78,105,830	(124,472,154)	(2,557,240)	(1,902,796)	(128,932,190)	(50,826,360)	1,437,949,843	-3.5%
2011	84,923,250	(127,435,564)	(2,210,738)	(2,003,705)	(131,650,007)	(46,726,757)	1,726,179,317	-2.7%

¹ Column (2) includes employee and employer contributions, as well as any purchased service credits during the year.

² Column (7) = Column (2) + Column (6).

SECTION 2: Valuation Results for the North Dakota Teachers' Fund for Retirement

Other Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation.

These include, but are limited to:

- the extent of turnover among the participants,
- retirement experience (earlier or later than expected),
- mortality (more or fewer deaths than expected),
- the number of disability retirements, and
- salary increases different than assumed

The net loss from this other experience for the year ended June 30, 2011 amounted to \$6,164,197, which is approximately 0.2% of the actuarial accrued liability.

The chart shows elements of the experience gain/(loss) for the most recent year.

CHART 14

Experience Due to Changes in Demographics for Year Ended June 30, 2011

1. Turnover	-\$1,969,102
2. Retirement	5,731,822
3. Deaths among retired members and beneficiaries	243,333
4. Salary/service increase for continuing actives	-5,668,793
5. Other decrements	-2,071,233
6. Miscellaneous	-2,430,224
7. Total	-\$6,164,197

SECTION 2: Valuation Results for the North Dakota Teachers' Fund for Retirement

C. DEVELOPMENT OF EMPLOYER COSTS

The amount of Annual Required Contribution as defined by GASB is comprised of an employer normal cost payment and a payment on the unfunded actuarial accrued liability. This total amount is then divided by the projected payroll for active members to determine the Annual Required Contribution of 13.16% of payroll.

GASB allows that the unfunded actuarial accrued liability be amortized over 30 years. This period is reset to 30 each year.

The chart compares this valuation's recommended contribution with the prior valuation.

**CHART 15
Annual Required Contribution**

	Year Beginning July 1			
	2011		2010*	
	Amount	% of Compensation	Amount	% of Compensation
1. Total normal contribution rate	\$50,760,259	9.80%	\$52,167,174	10.57%
2. Less: member contribution rate	<u>40,160,208</u>	<u>-7.75%</u>	<u>38,249,347</u>	<u>-7.75%</u>
3. Employer normal contribution rate	\$10,600,051	2.05%	\$13,917,827**	2.82%
4. Employer normal contribution rate, adjusted for timing***	11,013,197	2.12%	13,917,827	2.82%
5. Actuarial accrued liability	2,749,751,755		2,637,165,045	
6. Actuarial value of assets	1,822,598,871		1,841,960,219	
7. Unfunded actuarial accrued liability: (5) - (6)	927,152,884		795,204,826	
8. Payment on unfunded actuarial accrued liability, adjusted for timing	57,207,064	11.04%	49,223,215	9.97%
9. Annual Required Contribution (4) + (8)	<u>\$68,220,261</u>	<u>13.16%</u>	<u>\$63,141,042</u>	<u>12.79%</u>
10. Payroll supplied by System	\$488,764,292		\$465,007,110	
11. Payroll adjusted for one year's pay increase	\$518,196,234		\$493,539,965	

* 2010 results are based on the valuation performed by Gabriel, Roeder, Smith & Co.

** 2010 employer normal contribution rate reflects an adjustment for timing.

*** Contributions are assumed to be paid at the middle of every month.

SECTION 2: Valuation Results for the North Dakota Teachers' Fund for Retirement

The annual required contribution as of July 1, 2011 is based on all of the data described in the previous sections, the actuarial assumptions described in Section 4, and the Plan provisions adopted at the time of preparation of the Actuarial Valuation. It includes all changes affecting future costs, adopted benefit changes, actuarial gains and losses, and changes in the actuarial assumptions.

Reconciliation of Annual Required Contribution
The chart below details the changes in the annual required contribution from the prior valuation to the current year's valuation.

CHART 16

Reconciliation of GASB Annual Required Contribution from July 1, 2010 to July 1, 2011

The chart reconciles the annual required contribution from the prior valuation to the amount determined in this valuation.

Analysis of Change in GASB Annual Required Contribution

	July 1, 2011	July 1, 2010
1. Prior Valuation	12.79%	10.78%
2. Increases/(decreases) due to:		
a. Open amortization	-0.18%	-0.13%
b. Change in covered payroll	-0.61%	-0.18%
c. Employer contributions received at 8.75% rather than 12.79% for FY2011 or 10.78% for FY 2010	0.23%	0.11%
d. Liability experience	0.07%	0.07%
e. Investment experience	1.46%	2.00%
f. Assumption changes – Experience Study	0.00%	0.14%
g. Changes in amortization method	0.00%	0.00%
h. Legislative changes	<u>-0.60%</u>	<u>0.00%</u>
i. Total	<u>0.37%</u>	<u>2.01%</u>
3. Current valuation (1. + 2.i.)	13.16%	12.79%
4. Statutory employer contribution rate	8.75%	8.75%
5. Margin available [contribution sufficiency/(deficiency)] (4. – 3.)	<u>-4.41%</u>	<u>-4.04%</u>

SECTION 2: Valuation Results for the North Dakota Teachers' Fund for Retirement

D. INFORMATION REQUIRED BY THE GASB

Governmental Accounting Standards Board (GASB) reporting information provides standardized information for comparative purposes of governmental pension plans. This information allows a reader of the financial statements to compare the funding status of one governmental plan to another on relatively equal terms.

Critical information to the GASB is the historical comparison of the GASB required contribution to the actual contributions. This comparison demonstrates whether a plan is being funded within the range of GASB reporting requirements. Chart 17 below presents a graphical representation of this information for TFFR.

The other critical piece of information regarding TFFR's financial status is the funded ratio. This ratio compares the

actuarial value of assets to the actuarial accrued liabilities of the Plan as calculated under GASB. High ratios indicate a well-funded plan with assets sufficient to cover the plan's actuarial accrued liabilities. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other factors.

Although the GASB requires that the actuarial value of assets be used to determine the funded ratio, Chart 18 shows the funded ratio calculated using both the actuarial value of assets and the market value of assets.

The details regarding the calculations of these values and other GASB numbers may be found in Section 4, Exhibits III, IV, and VI.

These graphs show key GASB factors.

CHART 17
Statutory Versus Actual Contributions, Years Ended June 30

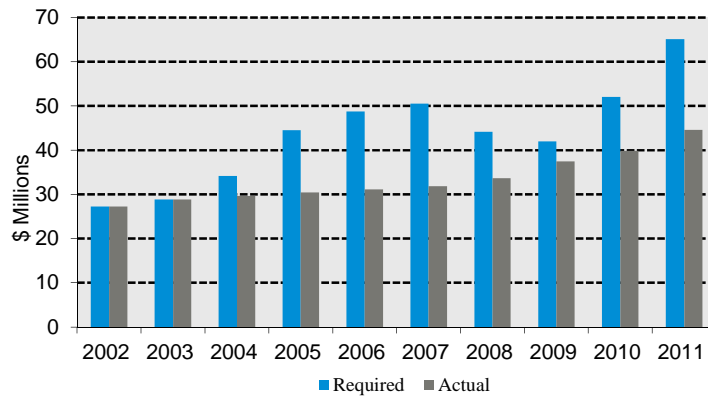
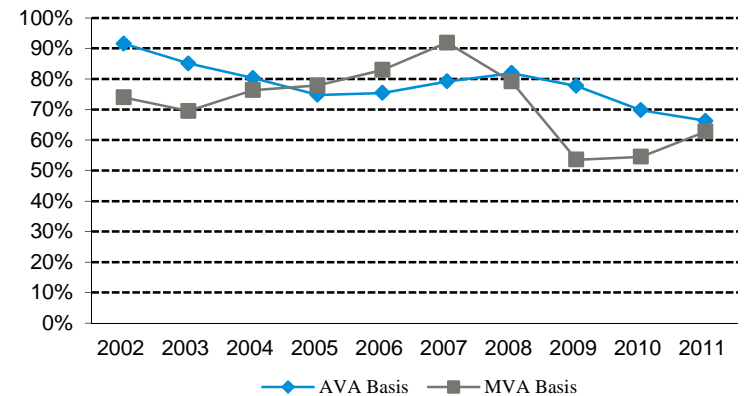


CHART 18
Funded Ratio, Years Ended June 30



SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

Membership Data

Membership data was provided on electronic files sent by the RIO staff. Data for active members includes sex, birth date, service, salary for the prior fiscal year, and accumulated contributions. Data for inactive members was similar, but also includes the members' unreduced benefit. For retired members, data includes status (service retiree, disabled retiree or beneficiary), sex, birth date, pension amount, date of retirement, form of payment, and beneficiary sex and birth date if applicable.

While not verifying the correctness of the data at the source, we performed various tests to ensure the internal consistency of the data and its overall reasonableness.

Membership statistics are summarized in Exhibit A. Exhibit B summarizes certain active member data, and the age/service distribution of active members among tiers is shown in Exhibit C. Exhibit D-1 and Exhibit D-2 show the distribution of retirees by option and by benefit amount. Exhibit E shows a reconciliation of the member data from last year's valuation to this year's valuation.

The number of active members increased by 1.0% since last year, from 9,907 to 10,004. Note that normally the actual number of members employed during the year will be somewhat higher than the valuation count, since the July 1 count excludes most June and July retirees but does not include new teachers joining the system for the next school year.

Total payroll increased 5.1% since last year. For all comparative purposes, payroll is the amount supplied by the RIO staff (i.e., the 2010-2011 member pay), annualized. However, this figure is increased by one year's assumed pay increase to determine the member's rate of pay (and thus, total projected payroll) at July 1, 2011. Pay is assumed to change only at the beginning of a school/fiscal year.

Average pay increased by 4.1%, from \$46,937 to \$48,857. This includes the impact of replacing more highly paid members who retire with new teachers. The average increase in salary for the 9,209 continuing members (members active in both this valuation and the preceding valuation) was 6.3%.

The average age of active members decreased from 44.2 years to 43.9 years, and their average service decreased from 14.0 years to 13.8 years.

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

The table below shows additional information about the active membership this year and last year. Tier 1 Grandfathered members are those who will have 65 points as of June 30, 2013, or are at least age 55 and vested. July 1, 2011 is the first valuation date at which Tier 1 Non-grandfathered members were included in the data. Tier 2 members are those hired or rehired after June 30, 2008. All new members in the future years will enter as Tier 2 members, so the number will increase over time. The Tier 1 Grandfathered and Non-grandfathered population will decrease each year as members leave due to retirement, termination, death, and disability.

Active Statistics		
	July 1, 2011	July 1, 2010*
Plan Eligibility**		
a. Tier 1 Grandfathered	4,405	8,525
b. Tier 1 Non-grandfathered	3,680	n/a
c. Tier 2	<u>1,919</u>	<u>1,382</u>
d. Total	10,004	9,907
Benefit Eligibility		
a. Non-Vested	1,991	1,551
b. Vested	5,830	6,330
c. Early Retirement	945	1,008
d. Normal Retirement	<u>1,134</u>	<u>1,018</u>
e. Total	10,004	9,907

* In 2010, there were only Tier 1 and Tier 2 members.

** Number of Tier 1 Grandfathered and Non-grandfathered members is estimated based on the June 30, 2011 census data and eligibility requirements specified above.

In addition, this table shows the number of members who are non-vested, those who are vested but not eligible for retirement, those who are eligible only for an early retirement (reduced) benefit, and those eligible for a normal (unreduced) benefit. As of the valuation date, 2,079 members were eligible for either reduced or unreduced retirement, an increase over last year's figure of 2,026.

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT A Member Data	July 1, 2011	July 1, 2010
1. Active members		
a. Males	2,590	2,557
b. Females	7,414	7,350
c. Total members	10,004	9,907
d. Total payroll supplied, annualized	\$488,764,292	\$465,007,110
e. Average salary	\$48,857	\$46,937
f. Average age	43.9	44.2
g. Average service	13.8	14.0
h. Total contributions with interest	\$626,002,547	\$600,383,691
i. Average contribution with interest	\$62,575	\$60,602
2. Vested inactive members		
a. Number	1,463	1,472
b. Total annual deferred benefits	\$8,984,442	\$8,881,616
c. Average annual deferred benefit	\$6,141	\$6,034
d. Average age	48.7	48.9
3. Non-vested inactive members		
a. Number	407	331
b. Employee contributions with interest due	\$1,178,287	\$941,049
c. Average refund due	\$2,895	\$2,843
d. Average age	38.6	38.3
4. Service retirees		
a. Number	6,252	6,029
b. Total annual benefits	\$124,977,333	\$117,235,355
c. Average annual benefit	\$19,990	\$19,445
d. Average age	70.7	70.7
5. Disabled retirees		
a. Number	120	111
b. Total annual benefits	\$1,586,544	\$1,419,363
c. Average annual benefit	\$13,221	\$12,787
d. Average age	61.1	60.9
6. Beneficiaries		
a. Number	561	532
b. Total annual benefits	\$7,046,988	\$6,570,359
c. Average annual benefit	\$12,561	\$12,350
d. Average age	72.8	72.8

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT B

Historical Summary of Active Member Data

Year Ending June 30,	Active Members		Covered Payroll		Average Salary		Average Age	Average Service
	Number	Percent Increase/ (Decrease)	Amount in \$ Millions	Percent Increase/ (Decrease)	\$ Amount	Percent Increase/ (Decrease)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1992	9,707	1.2%	250.9	6.7%	25,850	5.5%	41.7	12.8
1993	9,808	1.0%	260.4	3.8%	26,549	5.5%	42.2	13.2
1994	9,653	-1.6%	262.4	0.8%	27,187	5.2%	42.4	13.3
1995	9,663	0.1%	268.7	2.4%	27,803	2.3%	42.6	13.4
1996	9,797	1.4%	281.2	4.7%	28,708	3.3%	42.9	13.6
1997	10,010	2.2%	294.1	4.6%	29,382	2.3%	43.4	14.0
1998	9,896	-1.1%	298.4	1.5%	30,156	2.6%	43.5	14.0
1999	10,046	1.5%	314.6	5.4%	31,318	3.9%	44.0	14.4
2000	10,025	-0.2%	323.0	2.7%	32,223	2.9%	43.9	14.1
2001	10,239	2.1%	342.2	5.9%	33,421	3.7%	44.4	14.4
2002	9,931	-3.0%	348.1	1.7%	35,052	4.9%	44.5	14.4
2003	9,916	-0.2%	367.9	5.7%	37,105	5.9%	44.8	14.6
2004	9,826	-0.9%	376.5	2.3%	38,321	3.3%	44.9	14.7
2005	9,801	-0.3%	386.6	2.7%	39,447	2.9%	44.9	14.7
2006	9,585	-2.2%	390.1	0.9%	40,703	3.2%	44.8	14.6
2007	9,599	0.1%	401.3	2.9%	41,810	2.7%	44.7	14.5
2008	9,561	-0.4%	417.7	4.1%	43,684	4.5%	44.6	14.4
2009	9,707	1.5%	440.0	5.3%	45,327	3.8%	44.5	14.3
2010	9,907	2.1%	465.0	5.7%	46,937	3.6%	44.2	14.0
2011	10,004	1.0%	488.8	5.1%	48,857	4.1%	43.9	13.8

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT C

**Members in Active Service as of June 30, 2011
By Age, Years of Service, and Average Compensation**

Age	Years of Credited Service									
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & over
Under 25	295	295	--	--	--	--	--	--	--	--
	\$29,636	\$29,636	--	--	--	--	--	--	--	--
25 - 29	1,290	1,039	251	--	--	--	--	--	--	--
	36,663	35,468	\$41,611	--	--	--	--	--	--	--
30 - 34	1,206	427	624	155	--	--	--	--	--	--
	42,106	36,873	44,373	\$47,396	--	--	--	--	--	--
35 - 39	1,101	227	272	488	114	--	--	--	--	--
	46,969	38,415	45,697	50,606	\$51,471	--	--	--	--	--
40 - 44	1,287	181	205	323	429	148	1	--	--	--
	51,105	37,082	46,713	52,331	55,110	\$60,086	\$45,768	--	--	--
45 - 49	1,239	126	141	177	205	425	164	1	--	--
	53,472	38,116	46,073	50,325	56,262	58,321	59,004	\$48,290	--	--
50 - 54	1,425	116	119	148	167	243	397	234	1	--
	54,523	38,456	44,215	51,313	55,223	57,328	59,600	57,695	\$63,172	--
55 - 59	1,375	72	102	121	156	221	204	361	138	--
	56,155	37,302	46,597	47,853	54,715	56,238	59,419	61,791	62,259	--
60 - 64	693	53	57	80	78	103	91	68	125	38
	56,255	38,084	49,987	52,096	53,263	56,075	59,228	63,083	62,899	\$65,192
65 - 69	72	18	7	11	7	6	7	4	6	6
	47,690	33,121	46,488	43,150	50,468	56,202	48,319	60,506	61,204	66,575
70 & over	21	8	2	2	2	1	2	1	--	3
	42,135	22,808	43,904	44,672	44,789	43,760	58,710	56,180	--	72,764
Total	10,004	2,562	1,780	1,505	1,158	1,147	866	669	270	47
	\$48,857	\$35,721	\$44,895	\$50,477	\$54,748	\$57,711	\$59,296	\$60,453	\$62,535	\$65,852

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT D-1

Schedule of Annuitants by Type of Benefit as of June 30, 2011

Type of Benefits/ Form of Payment	Number	Annual Benefits Amount	Average Monthly Benefits
Service:			
Straight Life	2,739	\$44,713,511	\$1,360
100% J&S	2,153	51,740,475	2,003
50% J&S	501	11,303,545	1,880
5 Years C&L	28	342,679	1,020
10 Years C&L	184	3,098,331	1,403
20 Years C&L	63	1,277,318	1,690
Level	<u>584</u>	<u>12,501,473</u>	<u>1,784</u>
Subtotal:	6,252	\$124,977,333	\$1,666
Disability:			
Straight Life	97	\$1,315,239	\$1,130
100% J&S	11	126,065	955
50% J&S	8	102,333	1,066
5 years C&L	2	25,253	1,052
10 Years C&L	1	7,992	666
20 Years C&L	1	9,663	805
Level	<u>0</u>	<u>0</u>	<u>0</u>
Subtotal:	120	\$1,586,544	\$1,102
Beneficiaries:			
Straight Life	545	\$6,906,804	\$1,056
5 Years Certain Only	6	30,911	429
10 Years Certain Only	9	70,362	652
20 Years Certain Only	<u>1</u>	<u>38,911</u>	<u>3,243</u>
Subtotal:	561	\$7,046,988	\$1,047
Total:	6,933	\$133,610,865	\$1,606

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT D-2

Schedule of Annuitants by Monthly Benefit as of June 30, 2011

Monthly Benefit Amount	Number of Members	Female	Male	Average Service
Under \$200	215	157	58	6.67
200 - 399	471	362	109	12.68
400 - 599	489	394	95	18.65
600 - 799	436	342	94	23.40
800 - 999	410	305	105	24.94
1,000 - 1,199	515	377	138	27.63
1,200 - 1,399	524	352	172	29.15
1,400 - 1,599	574	370	204	30.24
1,600 - 1,799	568	373	195	30.26
1,800 - 1,999	557	350	207	31.14
2,000 - 2,199	474	300	174	31.07
2,200 - 2,399	394	223	171	32.26
2,400 - 2,599	313	190	123	32.88
2,600 - 2,799	267	145	122	33.78
2,800 - 2,999	200	94	106	33.49
3,000 - 3,199	155	83	72	34.46
3,200 - 3,399	91	34	57	34.19
3,400 - 3,599	79	31	48	34.63
3,600 - 3,799	55	16	39	34.72
3,800 - 3,999	35	14	21	35.86
4,000 & over	<u>111</u>	<u>31</u>	<u>80</u>	<u>36.71</u>
Total:	6,933	4,543	2,390	27.44

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT E

Reconciliation of Member Data by Status for the Year Ending June 30, 2011

	Active Members	Vested Terminated Members	Non-Vested Terminated Members	Service Retirees	Disabled Retirees	Beneficiaries	Total
A. Number as of July 1, 2010	9,907	1,472	331	6,029	111	532	18,382
B. Additions and new hires	712	0	0	0	0	0	712
C. Participant movement							
1. Retirement	-311	-57	-2	370	0	0	0
2. Disability	-8	-4	0	0	12	0	0
3. Died with beneficiary	-5	0	0	-32	-3	44*	4
4. Died without beneficiary	0	0	0	-115	0	-15	-130
5. Terminated vested	-141	141	0	0	0	0	0
6. Terminated non-vested	-115	0	115	0	0	0	0
7. Refunds	-117	-34	-9	0	0	0	-160
8. Rehired as active	83	-55	-28	0	0	0	0
9. Expired benefits	0	0	0	0	0	0	0
D. Data adjustments	<u>-1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>-1</u>
E. Number as of June 30, 2011	10,004	1,463	407	6,252	120	561	18,807

**This includes 4 beneficiaries from one deceased retiree and 2 beneficiaries from one deceased disabled*

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT F

Statement of Change in Plan Net Assets for Year Ended June 30, 2011

	Year Ending June 30	
	2011	2010
A. Assets available at beginning of year		
1. Value reported in prior valuation	\$1,437,949,843	\$1,309,716,730
2. Prior period adjustments	<u>0</u>	<u>0</u>
3. Revised value	\$1,437,949,843	\$1,309,716,730
B. Revenue for the year		
1. Contributions		
a. Employee contributions	\$38,869,260	\$36,848,481
b. Employer contributions	44,545,433	39,836,646
c. Purchased service credit	1,499,748	1,413,481
d. Interest and penalties	<u>8,809</u>	<u>7,222</u>
e. Total	\$84,923,250	\$78,105,830
2. Income		
a. Interest, dividends, and other income	\$36,055,355	\$32,786,256
b. Investment expenses	<u>-6,430,327</u>	<u>-6,234,267</u>
c. Net	\$29,625,028	\$26,533,989
3. Net realized and unrealized gains (losses)	<u>\$305,331,203</u>	<u>\$152,525,484</u>
4. Total revenue: (1e) + (2c) + (3)	\$419,879,481	\$257,165,303
C. Expenditures for the year		
1. Benefits and refunds		
a. Refunds	\$2,210,738	\$2,557,240
b. Regular annuity benefits	126,484,335	123,650,676
c. Partial lump-sum benefits paid	<u>951,229</u>	<u>821,478</u>
d. Total	\$129,646,302	\$127,029,394
2. Administrative and miscellaneous expenses	<u>2,003,705</u>	<u>1,902,796</u>
3. Total expenditures	\$131,650,007	\$128,932,190
D. Increase in net assets: (B4 – C3)	\$288,229,474	\$128,233,113
E. Value of assets at end of year: (A3 + D)	<u>\$1,726,179,317</u>	<u>\$1,437,949,843</u>

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT G

Statement of Plan Net Assets (Assets at Market or Fair Value)

	Year Ending June 30	
	2011	2010
1. Cash and cash equivalents (operating cash)	\$12,365,575	\$12,029,151
2. Receivables:		
a. Member and employer contributions	\$10,871,495	\$9,804,059
b. Investment income	7,419,806	6,724,760
c. Due from other funds	0	0
d. Miscellaneous receivables	<u>7,651</u>	<u>6,812</u>
e. Total receivables	\$18,298,952	\$16,535,631
3. Investments		
a. Invested cash	\$15,900,962	\$31,908,804
b. Domestic equities	653,723,804	509,476,470
c. International equities	395,756,180	286,954,142
d. Domestic fixed income	311,805,434	299,082,595
e. International fixed income	83,199,718	85,286,972
f. Real estate	174,937,685	135,503,973
g. Alternative investments	<u>63,012,510</u>	<u>63,465,615</u>
h. Total investments	\$1,698,336,293	\$1,411,678,571
4. Invested securities lending collateral	\$0	\$7,710,609
5. Equipment & software (net of depreciation)	\$3,050	\$66,013
6. Total assets: (1) + (2e) + (3h) + (4) + (5)	\$1,729,003,870	\$1,448,019,975
7. Liabilities		
a. Accounts payable	\$2,196,925	\$1,777,844
b. Accrued expenses	616,348	573,782
c. Due to other funds	11,280	7,897
d. Securities lending collateral	<u>0</u>	<u>7,710,609</u>
e. Total liabilities	\$2,824,553	\$10,070,132
8. Total market value of assets available for benefits: (6) – (7e)	\$1,726,179,317	\$1,437,949,843

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT G (continued)

Statement of Plan Net Assets (Assets at Market or Fair Value)

	Year Ending June 30	
	2011	2010
9. Asset allocation (investments)		
a. Invested cash	0.9%	2.3%
b. Domestic equities	38.5%	36.1%
c. International equities	23.3%	20.3%
d. Domestic fixed income	18.4%	21.2%
e. International fixed income	4.9%	6.0%
f. Real estate	10.3%	9.6%
g. Alternative investments	<u>3.7%</u>	<u>4.5%</u>
h. Total investments	100.0%	100.0%

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT H

Development of Unfunded Actuarial Accrued Liability

	Year Ending June 30	
	2011	2010
1. Unfunded actuarial accrued liability at beginning of year	\$795,204,826	\$545,568,876
2. Normal cost	52,167,174	47,791,528
3. Total contributions	-84,923,250	-78,105,830
4. Interest on:		
(a) Unfunded actuarial accrued liability and normal cost	\$65,703,073	\$45,557,171
(b) Total contributions	<u>3,070,588</u>	<u>3,124,233</u>
(c) Total interest: (4a) – (4b)	<u>62,632,485</u>	<u>42,432,938</u>
5. Expected unfunded actuarial accrued liability: (1) + (2) + (3) + (4c)	\$825,081,235	\$557,687,512
6. Changes due to (gain)/loss from:		
(a) Investments	\$120,206,192	\$159,513,335
(b) Demographics	<u>6,164,197</u>	<u>6,103,587</u>
(c) Total changes due to (gain)/loss: (6a) + (6b)	\$126,370,389	\$165,616,922
7. Change due to plan amendments	-24,298,740	0
8. Change in actuarial assumptions	0	71,900,392
9. Unfunded actuarial accrued liability at end of year: (5) + (6c) + (7) + (8)	<u>\$927,152,884</u>	<u>\$795,204,826</u>

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT I

Definitions of Pension Terms

The following list defines certain technical terms for the convenience of the reader:

Actuarial Accrued Liability

For Actives:

The equivalent of the accumulated normal costs allocated to the years before the valuation date.

Actuarial Accrued Liability

For Pensioners:

The single-sum value of lifetime benefits to existing pensioners. This sum takes account of life expectancies appropriate to the ages of the pensioners and the interest that the sum is expected to earn before it is entirely paid out in benefits.

Actuarial Cost Method:

A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the Annual Required Contribution.

Actuarial Gain or Actuarial Loss:

A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., TFFR's assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield in actuarial liabilities that are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

Actuarially Equivalent:	Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV):	<p>The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is:</p> <ol style="list-style-type: none">Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)Multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, andDiscounted according to an assumed rate (or rates) of return to reflect the time value of money.
Actuarial Present Value of Future Plan Benefits:	<p>The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would be provide sufficient assets to pay all projected benefits and expenses when due.</p>
Actuarial Valuation:	<p>The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB 25, such as the funded ratio and the ARC.</p>
Actuarial Value of Assets:	<p>The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly actuaries use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ARC.</p>

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

Actuarially Determined:	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.
Amortization Method:	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
Amortization Payment:	The portion of the pension plan contribution, or ARC, which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.
Annual Required Contribution (ARC):	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under GASB 25. The ARC consists of the Employer Normal Cost and the Amortization Payment.
Assumptions or Actuarial Assumptions:	<p>The estimates on which the cost of the Fund is calculated including:</p> <ul style="list-style-type: none">(a) <u>Investment return</u> - the rate of investment yield that the Fund will earn over the long-term future;(b) <u>Mortality rates</u> - the death rates of employees and pensioners; life expectancy is based on these rates;(c) <u>Retirement rates</u> - the rate or probability of retirement at a given age;(d) <u>Turnover rates</u> - the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement;(e) <u>Salary increase rates</u> - the rates of salary increase due to inflation and productivity growth.

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

Closed Amortization Period:	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Funding Period and Open Amortization Period.
Decrements:	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.
Defined Benefit Plan:	A retirement plan in which benefits are defined by a formula applied to the member's compensation and/or years of service.
Defined Contribution Plan:	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, and the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
Employer Normal Cost:	The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.
Experience Study:	A periodic review and analysis of the actual experience of the Fund which may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.
Funded Ratio:	The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA, although GASB 25 reporting requires the use of the AVA.
Funding Period or Amortization Period:	The term "Funding Period" is used in two ways. First, it is the period used in calculating the Amortization Payment as a component of the ARC. Second, it is a calculated item: the number of years in the future that will theoretically be required to amortize (i.e., pay off or eliminate) the Unfunded Actuarial Accrued Liability, based on the statutory employer contribution rate, and assuming no future actuarial gains or losses.

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

GASB:	Governmental Accounting Standards Board.
GASB 25 and GASB 27:	Governmental Accounting Standards Board Statements No. 25 and No. 27. These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 27 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 25 sets the rules for the systems themselves.
Investment Return:	The rate of earnings of the Fund from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
Margin:	The difference, whether positive or negative, between the statutory employer contribution rate and the Annual Required Contribution (ARC) as constrained by GASB 25.
Normal Cost:	That portion of the Actuarial Present Value of pension plan benefits and expenses allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated. Under the entry age normal cost method, the Normal Cost is intended to be the level cost (when expressed as a percentage of pay) needed to fund the benefits of a member from hire until ultimate termination, death, disability, or retirement.
Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. In other words, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount or in relation to covered payroll if the actuarial assumptions are realized.

SECTION 3: Supplemental Information for the North Dakota Teachers' Fund for Retirement

Unfunded Actuarial Accrued Liability:

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

Valuation Date or Actuarial Valuation Date:

The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

SECTION 4: Reporting Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT I

Summary of Actuarial Valuation Results

The valuation was made with respect to the following data supplied to us:

1. Pensioners as of the valuation date (including 561 beneficiaries in pay status)		6,933
2. Members inactive during year ended June 30, 2011 with vested rights		1,463
3. Members active during the year ended June 30, 2011		10,004
Fully vested	8,013	
Not vested	1,991	
4. Other non-vested inactive members as of June 30, 2011		407

SECTION 4: Reporting Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT I (continued)

Summary of Actuarial Valuation Results

	Actuarial Present Value of Projected Benefits	Actuarial Present Value of Future Normal Costs	Actuarial Accrued Liability
A. Determination of Actuarial Accrued Liability			
1. Active members			
a. Retirement benefits	\$1,725,295,108	\$376,149,523	\$1,349,145,585
b. Disability benefits	25,273,238	11,147,086	14,126,152
c. Death benefits	17,734,194	7,114,293	10,619,901
d. Withdrawal benefits	<u>86,628,082</u>	<u>108,765,771</u>	<u>-22,137,689</u>
e. Total	\$1,854,930,622	\$503,176,673	\$1,351,753,949
2. Inactive vested members	\$64,693,590	--	\$64,693,590
3. Inactive non-vested members	1,178,287	--	1,178,287
4. Retirees and beneficiaries	<u>1,332,125,929</u>	--	<u>1,332,125,929</u>
5. Total	\$3,252,928,428	\$503,176,673	\$2,749,751,755
B. Determination of Unfunded Actuarial Accrued Liability			
1. Actuarial accrued liability			\$2,749,751,755
2. Actuarial value of assets			<u>1,822,598,871</u>
3. Unfunded actuarial accrued liability: (1) – (2)			\$927,152,884

SECTION 4: Reporting Information for the North Dakota Teachers' Fund for Retirement

**EXHIBIT II
Actuarial Balance Sheet**

	July 1, 2011	July 1, 2010
A. Assets		
1. Current Assets		
a. Market Value	\$1,726,179,317	\$1,437,949,843
b. Adjustment for actuarial value	<u>96,419,554</u>	<u>404,010,376</u>
c. Actuarial value of assets	\$1,822,598,871	\$1,841,960,219
2. Actuarial present value of future contributions		
a. Member contributions*	\$565,581,978	\$349,425,401
b. Employer normal costs	-62,405,305	127,145,759
c. Unfunded actuarial accrued liability	<u>927,152,884</u>	<u>795,204,826</u>
d. Total	\$1,430,329,557	\$1,271,775,986
3. Total (1c + 2d)	<u>\$3,252,928,428</u>	<u>\$3,113,736,205</u>
B. Liabilities		
1. Retirees and beneficiaries	\$1,332,125,929	\$1,246,075,418
2. Inactive members	65,871,877	63,580,280
3. Active members	<u>1,854,930,622</u>	<u>1,804,080,507</u>
4. Total	<u>\$3,252,928,428</u>	<u>\$3,113,736,205</u>

*Reflects member contribution rate increases from 7.75% to 9.75% effective July 1, 2012, and to 11.75% effective July 1, 2014.

SECTION 4: Reporting Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT III

Schedule of Employer Contributions (GASB)

Fiscal Year	GASB 25 Annual Required Contribution (ARC)		Actual Employer Contribution		Percentage of GASB ARC Contributed
	% of Payroll ¹	Amount ²	% of Payroll	Amount	[(5)/(3)]
(1)	(2)	(3)	(4)	(5)	(6)
2002	7.75%	\$27,243,542	7.75%	\$27,243,542	100.0%
2003	7.75%	28,850,725	7.75%	28,850,725	100.0%
2004	8.94%	34,186,080	7.75%	29,635,584	86.7%
2005	11.34%	44,471,740	7.75%	30,388,265	68.3%
2006	12.12%	48,747,189	7.75%	31,170,851	63.9%
2007	12.29%	50,532,462	7.75%	31,865,466	63.1%
2008	10.15%	44,114,585	7.75%	33,683,550	76.4%
2009	9.24%	41,986,174	8.25%	37,487,655	89.3%
2010	10.78%	52,053,217	8.25%	39,836,646	76.5%
2011	12.79%	65,112,696	8.75%	44,545,433	68.4%

1. The GASB ARC for each fiscal year is based on the actuarial valuation as of the beginning of the year. Therefore, the FY 2011 ARC is based on the July 1, 2010 valuation. The ARC is defined as the contribution rate required to pay the employer normal cost and to amortize the unfunded actuarial accrued liability over a 30-year period as a level percentage of payroll, but not less than the statutory contribution rate. For FY 2005 and prior years, the unfunded actuarial accrued liability is amortized over a 20-year period as a level dollar amount.
2. The dollar amount of the ARC is based on actual payroll for the year. The FY 2011 ARC shown above differs from the estimated dollar amount shown in the July 1, 2010 actuarial valuation report because of differences between estimated and actual FY 2011 payroll.

SECTION 4: Reporting Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT IV

Schedule of Funding Progress (GASB)

Valuation Date	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AAL)	Unfunded/ Accrued Liability (UAAL) (3) – (2)	Funded Ratio (2) / (3)	Annual Covered Compensation	UAAL as a % of Compensation (4) / (6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
07/01/2002	\$1,443,500,000	\$1,575,800,000	\$132,300,000	91.6%	\$348,100,000	38.0%
07/01/2003	1,438,400,000	1,690,300,000	251,900,000	85.1%	367,900,000	68.5%
07/01/2004	1,445,600,000	1,800,400,000	354,800,000	80.3%	376,500,000	94.2%
07/01/2005	1,469,700,000	1,965,200,000	495,500,000	74.8%	386,600,000	128.2%
07/01/2006	1,564,000,000	2,073,900,000	509,900,000	75.4%	390,100,000	130.7%
07/01/2007	1,750,100,000	2,209,300,000	459,200,000	79.2%	401,300,000	114.4%
07/01/2008	1,909,500,000	2,330,600,000	421,200,000	81.9%	417,700,000	100.8%
07/01/2009	1,900,327,834	2,445,896,710	545,568,876	77.7%	439,986,705	124.0%
07/01/2010	1,841,960,220	2,637,165,045	795,204,825	69.8%	465,007,110	171.0%
07/01/2011	1,822,598,871	2,749,751,755	927,152,884	66.3%	488,764,292	189.7%

Note: Numbers for 7/1/2002 – 7/1/2009 valuation dates are rounded to the nearest hundred thousand.

SECTION 4: Reporting Information for the North Dakota Teachers' Fund for Retirement

Exhibit V

Determination of Contribution Sufficiency

			July 1, 2011	
A. Statutory Contributions	Percent of Payroll	Dollar Amount		
1. Member contributions	7.75%	\$40,160,208		
2. Employer contributions	8.75%	45,342,170		
3. Total	<u>16.50%</u>	<u>\$85,502,378</u>		
B. Required Contributions	Percent of Payroll	Dollar Amount		
1. Gross Normal Cost:				
(a) Retirement	7.39%	\$38,285,831		
(b) Disability	0.22%	1,157,117		
(c) Death	0.14%	713,830		
(d) Deferred termination benefit and refunds	<u>2.05%</u>	<u>10,603,481</u>		
(e) Total	<u>9.80%</u>	<u>\$50,760,259</u>		
2. Less member contribution rate	7.75%	\$40,160,208		
3. Employer normal cost rate: (1e) – (2)	2.05%	10,600,051		
4. Employer normal cost rate, adjusted for timing	2.12%	11,013,197		
5. Unfunded actuarial accrued liability rate, adjusted for timing	11.04%	57,207,064		
6. Total: (4) + (5)	<u>13.16%</u>	<u>\$68,220,261</u>		
C. Contribution Sufficiency / (Deficiency): (A.2) – (B.6)	-4.41%	-\$22,878,091		
Projected annual payroll for fiscal year beginning on the valuation date		\$518,196,234		

SECTION 4: Reporting Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT VI
Solvency Test

	July 1, 2011	July 1, 2010
1. Actuarial accrued liability (AAL)		
a. Active member contributions	\$626,002,547	\$600,383,691
b. Retirees and beneficiaries	1,332,125,929	1,246,075,418
c. Active and inactive members (employer financed)	791,623,279	790,705,936
d. Total	2,749,751,755	2,637,165,045
2. Actuarial value of assets	1,822,598,871	1,841,960,219
3. Cumulative portion of AAL covered		
a. Active member contribution	100.0%	100.0%
b. Retirees and beneficiaries	89.8%	99.6%
c. Active and inactive members (employer financed)	0.0%	0.0%

SECTION 4: Reporting Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT VII

Supplementary Information Required by the GASB

Valuation date	July 1, 2011
Actuarial cost method	Entry Age Normal cost method
Amortization method	Level percent of payroll, assuming payroll increases of 3.25% per annum
Amortization period	30-year open period
Asset valuation method	Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual market return and the expected return on the actuarial value, and is recognized over a five-year period.
Actuarial assumptions:	
Investment rate of return	8.00% per annum
Projected salary increases	Rates of 4.50% to 14.75%
Inflation	3%
Cost of living adjustments	None

SECTION 4: Reporting Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT VIII

Summary of Assumptions and Methods

Investment Return Rate:

8.00% per annum, compounded annually, equal to an assumed 3.00% inflation rate plus a 5.65% real rate of return, less 0.65% for expected investment and administrative expenses. (Adopted July 1, 1990; allocation among inflation, real rate of return, and expenses modified effective July 1, 2010.)

Mortality Rates:

Post-Termination Non-Disabled*:

GRS tables as shown below. (Adopted effective July 1, 2010)

i. 80% of GRS Table 378

ii. 75% of GRS Table 379

Post-Retirement Disabled*:

RP- 2000 Disabled-Life tables for Males and Females multiplied by 80% and 95% respectively. (Adopted effective July 1, 2010)

Number of Deaths per 100				
	Male Annuitants		Female Annuitants	
Age	Nondisabled	Disabled	Nondisabled	Disabled
20	0.044	1.806	0.023	0.708
25	0.057	1.806	0.023	0.708
30	0.069	1.806	0.028	0.708
35	0.073	1.806	0.039	0.708
40	0.092	1.806	0.057	0.708
45	0.136	1.806	0.078	0.708
50	0.222	2.318	0.115	1.096
55	0.381	2.835	0.283	1.572
60	0.358	3.363	0.354	2.075
65	0.457	4.014	0.327	2.662
70	1.198	5.007	0.672	3.575

Active Mortality*:

The non-disabled post-termination mortality rates multiplied by 60% for males and 40% for females. (Adopted effective July 1, 2010.)

*The mortality tables above reasonably reflect the projected mortality experience of the Fund as of the measurement date. As of the most recent experience study, the ratio of actual to the expected deaths was 118% for males and 115% for females (116% and 121% for males and females for post-disabled mortality). This provides a margin for future mortality improvement.

SECTION 4: Reporting Information for the North Dakota Teachers' Fund for Retirement

Retirement Rates:

The following rates of retirement are assumed for members eligible to retire. (Adopted effective July 1, 2010.)

Retirements per 100 members				
	Unreduced Retirement *		Reduced Retirement	
Age	Male	Female	Male	Female
50	25.00%	15.00%		
51	25.00%	15.50%		
52	25.00%	16.00%		
53	25.00%	16.50%		
54	25.00%	17.00%		
55	20.00%	17.50%	1.50%	1.50%
56	20.00%	18.00%	1.50%	1.50%
57	20.00%	18.50%	1.50%	1.50%
58	20.00%	19.00%	1.50%	1.50%
59	20.00%	19.50%	1.50%	1.50%
60	20.00%	20.00%	4.00%	3.00%
61	20.00%	20.00%	4.00%	3.00%
62	45.00%	35.00%	9.00%	8.00%
63	35.00%	30.00%	7.00%	12.00%
64	35.00%	30.00%	10.00%	15.00%
65	40.00%	30.00%		
66	30.00%	30.00%		
67	30.00%	30.00%		
68	30.00%	30.00%		
69	30.00%	30.00%		
70	25.00%	25.00%		
71	25.00%	25.00%		
72	25.00%	25.00%		
73	25.00%	25.00%		
74	25.00%	25.00%		
75	100.00%	100.00%		

* If a member reaches eligibility for unreduced retirement before age 65 under the rule of 85 (Grandfathered Tier 1) or the Rule of 90/ Age 60 (Non-grandfathered Tier 1 and Tier 2), 10% is added to the rate just at the age the member becomes first eligible for an unreduced retirement benefit.

SECTION 4: Reporting Information for the North Dakota Teachers' Fund for Retirement

Disability Rates:

Shown below for selected ages. (Adopted effective July 1, 2010.)

Disabilities per 100 Members	
Age	Number
20	0.011
25	0.011
30	0.011
35	0.011
40	0.033
45	0.055
50	0.088
55	0.154
60	0.297

Termination Rates:

Termination rates based on service, for causes other than death, disability, or retirement. (Adopted effective July 1, 2010.)

Termination Rates		
Service	Male	Female
0	33.00%	30.00%
1	15.00%	15.00%
2	12.00%	10.00%
3	9.00%	8.50%
4	8.00%	7.00%
5	7.00%	6.00%
6	6.00%	5.00%
7	5.00%	4.50%
8	4.00%	4.25%
9	3.75%	4.00%
10	3.50%	3.50%
11	3.25%	3.25%
12	3.00%	3.00%
13	2.75%	2.75%
14	2.50%	2.50%
15-19	1.25%	2.00%
20-24	1.25%	1.50%
25-28	1.25%	0.75%
29 & over	0.00%	0.00%

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Salary Increase Rates:

Inflation rate of 3.00% plus productivity increase rate of 1.50%, plus step-rate/promotional increase as shown below. (Adopted effective July 1, 2010.)

Years of Service	Annual Step-Rate Promotional Component	Annual Total Salary Increase
0	10.25	14.75
1	3.50	8.00
2	3.25	7.75
3	3.00	7.50
4	2.75	7.25
5	2.50	7.00
6	2.25	6.75
7	2.00	6.50
8	1.75	6.25
9	1.75	6.25
10	1.50	6.00
11	1.50	6.00
12	1.25	5.75
13	1.25	5.75
14	1.00	5.50
15	1.00	5.50
16	0.75	5.25
17	0.75	5.25
18	0.75	5.25
19	0.50	5.00
20	0.50	5.00
21	0.50	5.00
22	0.50	5.00
23	0.25	4.75
24	0.25	4.75
25 & over	0.00	4.50

Payroll Growth Rate:

3.25% per annum. This assumption does not include any allowance for future increase in the number of members. (Adopted effective July 1, 2010.)

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 effective July 1, 1992.)

SECTION 4: Reporting Information for the North Dakota Teachers' Fund for Retirement

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 effective July 1, 1990.)

Provision for Expenses:

The assumed investment return rate represents the anticipated net rate of return after payment of all administrative and investment expenses. These expenses are expected to reduce the gross investment return rate by 0.65%. (Adopted effective July 1, 2010.)

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 (or 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:

Normal cost and actuarial accrued liability are calculated on an individual basis and are allocated by service, with normal cost determined as if the current benefit provisions had always been in effect. Entry age is determined as the age at member's enrollment in TFFR. In the calculation of the normal cost, the benefit provisions applicable to future Tier 2 members were used. 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.

Amortization Period and Method:

The GASB Annual Required Contribution (ARC) is determined as the sum of (a) the employer normal cost rate, and (b) a level percentage of payroll required to amortize the unfunded actuarial accrued liability over 30 years. If the calculated ARC is less than the 8.75% statutory employer contribution rate, the 8.75% rate will be treated as the ARC. The 30-year period is an open period, and does not decrease in subsequent valuations.

SECTION 4: Reporting Information for the North Dakota Teachers' Fund for Retirement

EXHIBIT IX

Summary of Plan Provisions

Effective Date: July 1, 1971

Plan Year: Twelve-month period ending June 30th

Administration: The Teachers' Fund for Retirement (TFFR) is administered by a Board of Trustees. A separate State Investment Board is responsible for the investment of the trust assets, although the TFFR Board establishes the asset allocation policy. The Retirement and Investment Office is the administrative agency for TFFR.

Type of Plan: TFFR is a qualified governmental defined benefit retirement plan. For Governmental Accounting Standards Board purposes, it is a cost-sharing multiple-employer public employee retirement system.

Eligibility: All certified teachers of any public school in North Dakota participate in TFFR. This includes teachers, supervisors, principals, administrators, etc. Non-certified employees such as teacher's aides, janitors, secretaries, drivers, etc. are not allowed to participate in TFFR. Eligible employees become members at their date of employment.

Member Contributions: All active members contribute 7.75% of their salary per year. The employer may "pick up" the member's contributions under the provisions of Internal Revenue Code Section 414(h). The member contribution rate is schedule to increase to 9.75% effective July 1, 2012, and to 11.75% effective July 1, 2014. The total addition of 4.00% to the member contribution rate will remain in effect until TFFR is 90% funded on an actuarial basis. At that point, the member contribution rate will revert to 7.75%.

Salary: The member's total earnings are used for salary purposes, including overtime, etc., and including nontaxable wages under a Section 125 plan, but excluding certain extraordinary compensation, such as fringe benefits or unused sick and vacation leave.

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Employer Contributions:

The district or other employer which employs a member contributes a percentage of the member's salary. This percentage consists of a base percentage of 7.75%, plus, since July 1, 2008, additions as shown below.

Effective Date	Addition to 7.75% Base Rate	Employer Contribution Rate
July 1, 2008	0.50%	8.25%
July 1, 2010	1.00%	8.75%
July 1, 2012	3.00%	10.75%
July 1, 2014	5.00%	12.75%

However, the additions are subject to a “sunset” provision, so the contribution rate will revert to 7.75% once the funded ratio reaches 90%, measured using the actuarial value of assets. The contribution rate will not automatically increase if the funded ratio later falls back below 90%.

Service:

Employees receive credit for service while a member. A member may also purchase credit for certain periods, such as time spent teaching at a public school in another state, by paying the actuarially determined cost of the additional service. Special rules and limits govern the purchase of additional service.

Tiers:

Members who join TFFR by June 30, 2008 are in Tier 1, while members who join later are in Tier 2. If a Tier 1 member terminates, takes a refund, and later rejoins TFFR after June 30, 2008, that member will be in Tier 2. As of June 30, 2013, Tier 1 members who are at least age 55 and vested (3 years of service) as of the effective date, or the sum of the member's age and service is at least 65 are considered Grandfathered, and previous plan provisions will not change. For Tier 1 members who do not fit this criteria as of June 30, 2013, are considered Non-grandfathered. These members along with Tier 2, will have new plan provisions, as described below.

Final Average Compensation (FAC): The average of the member's highest three (Tier 1 members) or five (Tier 2 members) plan year salaries. Monthly benefits are based on one-twelfth of this amount.

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Normal Retirement:

a. Eligibility:

- Tier 1 members may retire upon Normal Retirement on or after age 65 with credit for 3 years of service, or if earlier, when the sum of the member's age and service is at least 85. Effective as of June 30, 2013, Tier 1 members who are at least age 55 and vested (3 years of service) as of the effective date, or the sum of the member's age and service is at least 65, normal retirement eligibility will not change (participants are Grandfathered). For those who do not meet this criteria as of June 30, 2013 (Non-grandfathered), members may retire upon Normal Retirement on or after age 65 with credit for 3 years of service, or if earlier, when the sum of the member's age and service is at least 90, with a minimum age of 60.
- Tier 2 members may retire upon Normal Retirement on or after age 65 with credit for 5 years of service, or if earlier, when the sum of the member's age and service is at least 90. Effective July 1, 2013, Tier 2 members may retire upon Normal Retirement on or after age 65 with credit for 5 years of service, or if earlier, when the sum of the member's age and service is at least 90, with a minimum age of 60.

b. Monthly Benefit: 2.00% of FAC (monthly) times years of service.

c. Payment Form: Benefits are paid as a monthly life annuity, with a guarantee that if the payments made do not exceed the member's contributions plus interest, determined as of the date of retirement, the balance will be paid in a lump-sum to the member's beneficiary. Optional forms of payment are available; see below.

Early Retirement:

a. Eligibility: Tier 1 members may retire early after reaching age 55 with credit for three years of service, while Tier 2 members may retire early after reaching age 55 with credit for five years of service.

b. Monthly Benefit: 2.00% of FAC (monthly) times years of service, multiplied by a factor which reduces the benefit 6% for each year from the earlier of (i) age 65, or (ii) the age at which current service plus age equals 85 (Tier 1 members) or 90 (Tier 2 members). Effective July 1, 2013 for members who are either Non-grandfathered Tier 1 or Tier 2: 2.00% of FAC (monthly) times years of service, multiplied by a factor which reduces the benefit 8% for each year from the earlier of (i) age 65, or (ii) the age at which current service plus age equals 90 with a minimum age of 60.

SECTION 4: Reporting Information for the North Dakota Teachers' Fund for Retirement

c. Payment Form: Same as for Normal Retirement above.

Disability Retirement:

a. Eligibility: A member is eligible provided he/she has credit for at least one year of service. Effective July 1, 2013, a member is eligible provided he/she has credit for at least five years of service.

b. Monthly Benefit: 2.00% of FAC (monthly) times years of service with a minimum 20 years of service. Effective July 1, 2013, 2.00% of FAC (monthly) times years of service.

c. Payment Form: The disability benefit commences immediately upon the member's retirement. Benefits cease upon recovery or reemployment. Disability benefits are payable as a monthly life annuity with a guarantee that, at the member's death, the sum of the member's contributions plus interest as of the date of retirement that is in excess of the sum of payments already received will be paid in a lump sum to the member's beneficiary.

d. All alternative forms of payment other than level income and the partial lump-sum option are also permitted in the case of disability retirement. For basis recovery only, disability benefits are converted to normal retirement benefits when the member reaches normal retirement age or age 65, whichever is earlier.

Deferred Termination Benefit:

a. Eligibility: A Tier 1 member with at least three years of service, or a Tier 2 member with at least five years of service, who does not withdraw his/her contributions from the fund, is eligible for a deferred termination benefit.

b. Monthly Benefit: 2.00% of FAC (monthly) times years of service. Both FAC and service are determined at the time the member leaves active employment. Benefits may commence unreduced at age 65 or when the sum of the member's age and service is 85 (Grandfathered Tier 1 members) or 90 with a minimum age of 60 (Non-grandfathered Tier 1 and Tier 2 members). Reduced benefits may commence at or after age 55 if the member is not eligible for an unreduced benefit.

c. Payment Form: The form of payment is the same as for Normal Retirement above.

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d. Death Benefit: A member who dies after leaving active service but before retiring is entitled to receive a benefit as described below.

Withdrawal (Refund) Benefit:

a. Eligibility: Tier 1 members leaving covered employment with less than three years of service, and Tier 2 members leaving covered employment with less than five years of service, are eligible. Optionally, vested members may withdraw their contributions plus interest in lieu of the deferred benefits otherwise due.

b. Benefit: The member who withdraws receives a lump-sum payment of his/her employee contributions, plus the interest credited on these contributions. Interest is credited at 6% per year (0.5% per month).

Death Benefit:

a. Eligibility: Death must have occurred while an active or an inactive, non-retired member.

b. Benefit: Upon the death of a nonvested member, a refund of the member's contributions and interest is paid. Upon the death of a vested member, the beneficiary may elect (i) the refund benefit above, or (ii) a life annuity of the normal retirement benefit, determined under Option One below, based on FAC and service as of the date of death, but without applying any reduction for the member's age at death. In determining the reduction for Option One, members not eligible for normal retirement benefits use the Fund's option tables for disabled members.

Optional Forms of Payment:

There are optional forms of payment available on an actuarially equivalent basis, as follows:

Option 1 - A life annuity payable while either the participant or his beneficiary is alive, "popping-up" to the original life annuity if the beneficiary predeceases the member.

Option 2 - A life annuity payable to the member while both the member and beneficiary are alive, reducing to 50% of this amount if the member predeceases the beneficiary, and "popping-up" to the original life annuity if the beneficiary predeceases the member.

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Option 3a - A life annuity payable to the member, with a guarantee that, should the member die prior to receiving 60 payments (five years), the payments will be continued to a beneficiary for the balance of the five-year period. (This option has been replaced by Option 3b. It is not available to employees who retire on or after August 1, 2003. Retirees who elected this option prior to that date are unaffected.)

Option 3b - A life annuity payable to the member, with a guarantee that, should the member die prior to receiving 240 payments (twenty years), the payments will be continued to a beneficiary for the balance of the twenty-year period. (This option replaced Option 3a effective August 1, 2003.)

Option 4 - A life annuity payable to the member, with a guarantee that, should the member die prior to receiving 120 payments (10 years), the payments will be continued to a beneficiary for the balance of the ten-year period.

Option 5 - A non-level annuity payable to the member, designed to provide a level total income when combined with the member's Social Security benefit. This option is not available to disabled retirees.

In addition, members may elect a partial lump-sum option (PLSO) at retirement. Under this option, a member receives an immediate lump-sum equal to 12 times the monthly life annuity benefit and a reduced annuity. The reduction is determined actuarially. The member can then elect to receive the annuity benefit in one of the other optional forms, except that members who receive a PLSO may not elect Option 5 – the level income option. The PLSO is not available to disabled retirees or retirees who are not eligible for an unreduced retirement benefit.

Actuarial equivalence is based on tables adopted by the Board of Trustees.

Cost-of-living Increase:

From time to time, TFFR has been amended to grant certain post-retirement benefit increases. However, TFFR has no automatic cost-of-living increase features.

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EXHIBIT X

Summary of Plan Changes

1991 Legislative Session:

1. Benefit multiplier increased from 1.275% to 1.39% for all future retirees.
2. Provide a post-retirement benefit increase for all annuitants receiving a monthly benefit on June 30, 1991. The monthly increase is the greater of a 10% increase or a level increase based on years of service and retirement date:
 - a. \$3 per year of service for retirements before 1980
 - b. \$2 per year of service for retirements between 1980 and 1983
 - c. \$1 per year of service for retirements from 1984 through June 30, 1991

Minimum increase is \$5 per month. Maximum increase is \$75 per month.

1993 Legislative Session:

1. Benefit multiplier increased from 1.39% to 1.55% for all future retirees.
2. Provide a post-retirement benefit increase for all annuitants receiving a monthly benefit on June 30, 1993. The monthly increase is the greater of a 10% increase or a level increase based on years of service and retirement date:
 - a. \$3 per year of service for retirements before 1980
 - b. \$2.50 per year of service for retirements between 1980 and 1983
 - c. \$1 per year of service for retirements from 1984 through June 30, 1993

Minimum increase is \$5 per month. Maximum increase is \$100 per month.

3. Minimum retirement benefit increased to \$10 times years of service up to 25, plus \$15 times years of service greater than 25. (Previously was \$6 up to 25 years of service plus \$7.50 over 25 years of service.)
4. Disability benefit changed to 1.55% of FAC times years of service using a minimum of 20 years of service.

1995 Legislative Session:

There were no material changes made during the 1995 legislative session.

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1997 Legislative Session:

1. Benefit multiplier increased from 1.55% to 1.75% for all future retirees.
2. Member contribution rate and employer contribution rate increased from 6.75% to 7.75%.
3. A \$30.00/month benefit improvement was granted to all retirees and beneficiaries.

1999 Legislative Session:

1. Active members will now be fully vested after three years (rather than five years) of service.
2. Early retirement benefits will be reduced 6% per year from the earlier of (i) age 65, or (ii) the date as of which age plus service equals 85 (rather than from age 65 in all cases).
3. An ad hoc COLA was provided for all retirees and beneficiaries. This increase is equal to an additional \$2.00 per month for each year of service plus \$1.00 per month for each year since the member's retirement.
4. The formula multiplier was increased from 1.75% to 1.88% effective July 1, 1999.

2001 Legislative Session:

1. An ad hoc COLA was provided for all retirees and beneficiaries. The ad hoc COLA increase is equal to an additional \$2.00 per month for each year of service plus \$1.00 per month for each year since the member's retirement. Retirees and beneficiaries will also receive two additional increases equal to 0.75% times the monthly benefit, payable July 1, 2001 and July 1, 2002. The two 0.75% increases are conditional. If the actuarial margin is a shortfall, i.e., is negative, by 60 basis points or more, or if the margin has been negative by 30 or more basis points for two years, the Board could elect to suspend the increase.
2. The formula multiplier was increased from 1.88% to 2.00% effective July 1, 2001.

2003 Legislative Session:

1. Partial lump-sum option adopted, equal to twelve times the monthly life annuity benefit. Not available if level-income option is elected. Not available for reduced retirement or disability retirement.
2. Five-year certain and life option replaced with 20-year certain and life. This does not impact retirees who retired under the five-years certain and life option.

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3. Employer service purchase authorized.
4. Active members of the Department of Public Instruction are permitted to make a one-time irrevocable election to transfer to the North Dakota Public Employees Retirement System in FY 2004. Both assets and liabilities for all TFFR service will be transferred for electing employees. Transferred assets will be based on the actuarial present value of the member's accrued TFFR benefit, or the member's contribution account balance if larger.

2005 Legislative Session:

There were no material changes made during the 2005 legislative session.

2007 Legislative Session:

1. For active members hired on or after July 1, 2008 (called Tier 2 members):
 - a. Members will be eligible for an unreduced retirement benefit when they reach age 65 with at least five years of service (rather than three years of service); or if earlier, when the sum of the member's age and service is at least 90 (rather than 85).
 - b. Members will be eligible for a reduced (early) retirement benefit when they reach age 55 with five years of service, rather than three years of service.
 - c. Members will be fully vested after five years of service (rather than three year of service).
 - d. The Final Average Compensation for Tier 2 members is the average of the member's highest five plan year salaries, rather than the average of the three highest salaries.
2. The employer contribution rate increases from 7.75% to 8.25% effective July 1, 2008, but this rate will be reset to 7.75% once the Fund reaches a 90% funded ratio, measured using the actuarial value of assets. (If the funded ratio later falls below 90% again, the contribution rate will not automatically return to 8.25%.)
3. Employer contributions are required on the salary of reemployed retirees.
4. Active members of the Department of Career and Technical Education are permitted to make a one-time irrevocable election to transfer to the North Dakota Public Employees Retirement System in FY 2008. Both assets and liabilities for all TFFR service will be transferred for electing employees. Transferred assets will be the actuarial present value of the member's accrued TFFR benefit, or the member's contribution account balance, if larger.

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2009 Legislative Session:

1. An individual who retired before January 1, 2009, and is receiving monthly benefits is entitled to receive a supplemental payment from the fund. The supplemental payment is equal to an amount determined by taking twenty dollars multiplied by the member's number of years of service credit plus fifteen dollars multiplied by the number of years since the member's retirement as of January 1, 2009. The supplemental payment may not exceed the greater of 10% of the member's annual annuity or \$750.00. TFFR will make the supplemental payment in December 2009.
2. The employer contribution rate increases from 8.25% to 8.75% effective July 1, 2010, but this rate will be reset to 7.75% once the Fund reaches a 90% funded ratio, measured using the actuarial value of assets. (If the funded ratio later falls below 90% again, the contribution rate will not automatically return to 8.75%.)

2011 Legislative Session:

1. The employer contribution rate increases from 8.75% to 10.75% effective July 1, 2012, and increases thereafter to 12.75% effective July 1, 2014. The member contribution rate increases from 7.75% to 9.75% effective July 1, 2012, and increases thereafter to 11.75% effective July 1, 2014. Employer and member contributions will be reset to 7.75% once the Fund reaches a 90% funded ratio, measured using the actuarial value of assets.
2. For current Tier 1 members who, as of June 30, 2013, are vested (at least 3 years of service), and at least age 55, OR the sum of the member's age and service is at least 65, are considered a Tier 1 Grandfathered member. Current Tier 1 members, who do not meet this criteria as of June 30, 2013, are considered a Tier 1 Non-grandfathered member.
3. Eligibility for normal/ unreduced retirement benefits do not change for Tier 1 Grandfathered members. For Tier 1 Non-grandfathered and Tier 2 members, effective after June 30, 2013, unreduced retirement benefits start when the member reaches age 65 and is vested (3 years for Tier 1 Non-grandfathered, 5 years for Tier 2); or if earlier, when the sum of the member's age and service is at least 90, with a minimum age of 60.
4. Early retirement benefits do not change for Tier 1 Grandfathered members. For Tier 1 Non-grandfathered and Tier 2 members, effective after June 30, 2013, the normal retirement benefit will be reduced by 8% per year from the earlier of age 65 OR the age at which the sum of the member's age and service is at least 90, with a minimum age of 60.
5. Effective after June 30, 2013, all members may retire on disability after a period of at least five years of service (rather one year of service). The amount of the benefit is based on a 2% multiplier and actual service (rather than a minimum of twenty years of service in the current calculation).

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6. Effective July 1, 2012, re-employed retirees are required to pay member contributions.
7. Effective August 1, 2011, beneficiary and death benefit provisions were updated, and the 60-month death payment benefit was removed.