North Dakota Teachers' Fund For Retirement

NDTFFR Board Meeting
AGENDA

Thursday, January 24, 2019 - 1:00 pm
NDRIO Conference Room
3442 E. Century Avenue, Bismarck, ND

1. **Call to Order and Approval of Agenda** – Pres. Lech (Board Action)

2. **Approval of Minutes of October 25, 2018 Board Meeting** – Pres. Lech (Board Action) 5 min.

3. **2018 GASB 67 & 68 Report** – Kim Nicholl and Matt Strom, Segal via Video (Board Action) 10 min.

4. **2018 Valuation Update – Active Member Population Growth** – Kim Nicholl and Matt Strom, Segal via Video (Information) 10 min.

5. **Development of Stochastic Projections and Plan Management Policy** – Kim Nicholl and Matt Strom, Segal via Video (Information) 30 min.

6. **Actuarial Proposals –** Fay Kopp (Board Action) 30 min.
   1. Actuarial Contract Proposal
   2. Stochastic Projections and Plan Management Policy Proposal

*****BREAK******

7. **2019 Legislative Update -** Fay Kopp (Board Action) 20 min.

8. **Quarterly Investment Update –** Dave Hunter (Information) 15 min.

9. **TFFR Employer Reporting Reviews Update** – Fay Kopp (Information) 10 min.

10. **Quarterly Audit Services Update** – Sara Sauter (Information) 10 min.

11. **Annual Retirement Statistics Report** – Shelly Schumacher (Board Action) 15 min.

12. **2018 CAFR and PPCC Awards** – Fay Kopp (Information) 5 min.

13. **Consent Agenda** – Disability and QDRO applications (Board Action) 5 min.

14. **Other Business**

15. **Adjournment**

Next Board Meeting: March 21, 2019

Any individual requiring an auxiliary aid or service should contact the Retirement and Investment Office (RIO) at 701-328-9885 at least three (3) days prior to the scheduled meeting.

NORTH DAKOTA TEACHERS' FUND FOR RETIREMENT
MINUTES OF THE
OCTOBER 25, 2018, BOARD MEETING

BOARD MEMBERS PRESENT:	Rob Lech, President
	Mike Burton, Vice President
	Kirsten Baesler, State Supt. DPI
	Toni Gumeringer, Trustee
	Cody Mickelson, Trustee
	Mel Olson, Trustee
	Kelly Schmidt, State Treasurer
STAFF PRESENT:	Paula Brown, Retirement Programs Spec
	David Hunter, ED/CIO
	Fay Kopp, Deputy ED/CRO
	Missy Kopp, Retirement Assistant
	Sara Sauter, Audit Services Supvr
	Shelly Schumacher, Retirement Program Mgr
	Denise Weeks, Retirement Programs Spec
OTHERS PRESENT:	Brian Barnett - APT
	Tanya Dybal – Segal Consulting
	Kathy Kindschi – ND United – Retired
	Kim Nicholl – Segal Consulting
	Anders Odegaard, Attorney General's Office

CALL TO ORDER:

Dr. Rob Lech, President of the Teachers' Fund for Retirement (TFFR) Board of Trustees, called the meeting to order at 1:00 p.m. on Thursday, October 25, 2018, in the Peace Garden Room at the State Capitol in Bismarck, N.D.

THE FOLLOWING MEMBERS WERE PRESENT REPRESENTING A QUORUM: SUPT. BAESLER, MR. BURTON, MRS. GUMERINGER, PRES. LECH, MR. MICKELSON, MR. OLSON AND TREASURER SCHMIDT.

AGENDA:

The Board considered the agenda for the October 25, 2018 meeting.

IT WAS MOVED BY MR. OLSON AND SECONDED BY MR. BURTON AND CARRIED BY A VOICE VOTE TO ACCEPT THE AGENDA.

AYES: SUPT. BAESLER, TREASURER SCHMIDT, MR. BURTON, MR. MICKELSON, MRS. GUMERINGER, MR. OLSON AND PRES. LECH
NAYS: NONE
MOTION CARRIED.

MINUTES:

The Board considered the minutes of the September 24, 2018, special meeting and the September 27, 2018, regular meeting.

IT WAS MOVED BY SUPT. BAESLER AND SECONDED BY MRS. GUMERINGER AND CARRIED BY A VOICE VOTE TO ACCEPT THE SEPTEMBER 24, 2018, AND SEPTEMBER 27, 2018, MINUTES AS DISTRIBUTED.

AYES: MR. MICKELSON, MR. OLSON, TREASURER SCHMIDT, MR. BURTON, SUPT. BAESLER, MRS. GUMERINGER, AND PRES. LECH
NAYS: NONE
MOTION CARRIED.

2018 ACTUARIAL VALUATION REPORT:

Ms. Kim Nichol and Ms. Tanya Dybal, Segal Consulting, presented the Actuarial Valuation Report as of July 1, 2018. Highlights included the following:

- Market value of assets returned 9.0% for year ending 6/30/18 (Segal calculation). Gradual recognition of deferred losses resulted in 7.9% return on actuarial value of assets.
- Net impact on funded ratio was an increase from 63.7% (as of 7/1/2017) to 65.4% (as of 7/1/2018).
- Effective amortization period decreased from 27 years to 26 years.
- Net impact on actuarially determined contribution (ADC) was a decrease from 12.99% of payroll to 12.94% of payroll. Based on the employer contribution rate of 12.75%, the contribution deficiency has decreased from 0.24% of payroll to 0.19% of payroll.
- GASB Net Pension Liability decreased from $1.37 billion as of 6/30/17, to $1.33 billion as of 6/30/18.

After board discussion of the 2018 valuation report and funding projections,

IT WAS MOVED BY MR. OLSON AND SECONDED BY MR. BURTON AND CARRIED BY A ROLL CALL VOTE TO APPROVE THE 2018 ACTUARIAL VALUATION REPORT FROM SEGAL.

AYES: TREASURER SCHMIDT, SUPT. BAESLER, MRS. GUMERINGER, MR. OLSON, MR. BURTON, MR. MICKELSON, AND PRES. LECH.
NAYS: NONE
MOTION CARRIED.

ACTUARIAL ISSUES:

Ms. Nichol and Ms. Dybal, presented information related to recent actuarial issues and how they might affect the TFFR plan in the future. 1) Society of Actuaries’ Public Sector Mortality Table Analysis; 2) Actuarial Standards of Practice (ASOP) 4 – Measuring pension obligations and determining pension plan costs or contributions; ASOP 51 – Assessment and disclosure of risk associated with measuring pension obligations and determining pension plan contributions; and 3) Pension plan risk analysis and stress testing. Segal reviewed the different types of pension plan risks including investment return, plan maturity, contribution, longevity, and retirement risk. They also described tests to measure risk including sensitivity tests, stress tests, scenario tests, and stochastic projections.

Segal recommended that TFFR consider developing a plan management policy to better identify and establish criteria to evaluate the ongoing financial health and sustainability of the plan. A plan management policy would illustrate market volatility and contribution inadequacy risks through stochastic modeling and allow the Board to evaluate pension plan changes for effectiveness.

Board discussion followed. Staff will work with Segal to develop a proposal outlining a suggested project plan, timeline, deliverables, and cost for Board consideration at a future meeting.

BOARD EDUCATION - DB/DC/HYBRID/CASH BALANCE PLANS:

Ms. Nichol discussed the implications of the teacher protests on public pension plans and employees in Kentucky, Colorado, and Arizona.

Ms. Nichol compared the risks and features of different types of pension plan designs including defined benefit, defined contribution, hybrid, and cash balance plans.

ACTUARIAL REVIEW OF PROPOSED LEGISLATION:

Ms. Nichol commented on Segal’s actuarial review of Bill Draft #20 and Bill Draft #126, as detailed in their September 4, 2018 letters.

LEGISLATIVE UPDATE:

Mrs. Kopp informed the Board that Segal presented the 2018 actuarial valuation report to the Legislative Employee Benefits Programs Committee (LEBPC), and there were requests for additional TFFR information.

Mrs. Kopp reported the LEBPC gave a favorable recommendation on Bill Draft #126 which relates to IRS compliance updates submitted by the TFFR Board. The Committee gave an unfavorable recommendation on Bill Draft #20 which revises the duties of the LEBPC.

Mr. Hunter also met with the LEBPC and provided them with an update on how the current financial markets are impacting the state’s funds.

2017-18 RETIREE REEMPLOYMENT REPORT:

Ms. Schumacher reviewed the 2017-18 Reemployed Retiree Report. The total number of reemployed retirees was 347 out of a total of 8,743 retirees or 4%. 139 of 214 employers employed TFFR Retirees. Total salaries earned by reemployed retirees was $8.9 million or about $25,900 per retiree.

QUARTERLY AUDIT SERVICES UPDATE:

Ms. Sauter provided the September 20, 2018 quarterly Audit Services update. The Audit Services Division conducted a Risk Assessment of the ND Retirement and Investment Office (NDRIO). Audit Services also has a Cost Effective Benefit Payment Audit that is in progress and worked with the external auditor on the GASB 68 census data audit.

TFFR Employer audits include: One employer audit was completed; two employer audits were in progress and three employer audits were pending but not yet started.

Based on the results of the risk assessment, Audit Services will be splitting their time more evenly between TFFR and the State Investment Board (SIB). Historically, Audit Services has spent the majority of their time on TFFR Employer Compliance audits.

TRUSTEE EDUCATIONAL CONFERENCE REPORTS:

Mr. Olson and Mr. Mickelson reported on the National Council on Teacher Retirement (NCTR) Annual Conference which they attended in October 2018. Mr. Burton and Mrs. Gumeringer reported on the National Education Association Pension Forum which they attended in June 2018. Mrs. Gumeringer also reported on Callan College which she attended in July 2018.

Executive Session – Attorney Consultation, Benefit Appeal #2018-1A:

Pres. Lech asked the Board if they would like to enter into Executive Session for attorney consultation on Benefit Appeal #2018-1A. He also informed the Board that there have been no updates since the last meeting. No motion was made, so the Board did not go into Executive Session.

OTHER BUSINESS:

Mrs. Kopp informed the Board she received two requests from the LEBPC at their meeting on October 25, 2018. The first request is related to the actuarial valuation report. The Committee requested projections of TFFR’s future funding level assuming active member population growth in the future. The Committee Chair asked that the Actuary conduct an actuarial study and provide information on this topic at the LEBPC December 2018 meeting.

The Board discussed their fiduciary responsibilities and the additional costs to the TFFR trust fund. After discussion,

IT WAS MOVED BY TREASURER SCHMIDT AND SECONDED BY MR. MICKELSON AND CARRIED BY A ROLL CALL VOTE TO APPROVE AN ACTUARIAL STUDY RELATED TO PROJECTED ACTIVE MEMBER POPULATION GROWTH BASED ON THE REQUEST FROM THE LEBPC.

AYES: MRS. GUMERINGER, MR. BURTON, MR. MICKELSON, SUPT. BAESLER, MR. OLSON, TREASURER SCHMIDT AND PRES. LECH.
NAYS: NONE
MOTION CARRIED

The Board discussed a second request made by a LEBPC member to determine the actuarial impact on the fund if TFFR plan provisions were modified to change the current 5-year final average salary calculation to 10-year final average salary or career average salary calculation for a new tier of members. There is no bill draft currently connected to this request. Board members discussed the additional cost involved and the precedence this could set. The Board decided if a bill that outlines the proposed changes is drafted and accepted by the LEBPC for study, the Board will then request an actuarial study as is done with other bill drafts.

Mrs. Kopp will inform the LEBPC of the Board's response to their requests for additional actuarial information.

ADJOURNMENT:

With no further business to come before the Board, Pres. Lech adjourned the meeting at 4:26 p.m.

Respectfully Submitted:

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Dr. Rob Lech, President
Teachers' Fund for Retirement Board

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Missy Kopp
Reporting Secretary

North Dakota Teachers' Fund For Retirement

MEMORANDUM

TO: **TFFR Board**

FROM: **Fay Kopp**

DATE: **January 17, 2019**

SUBJ: **2018 GASB 67 & 68 Report**

Kim Nicholl and Matt Strom, Segal Consultants, will attend the January board meeting via video conference. They will present the 2018 GASB 67/68 report (attached).

Board Action Requested: Board motion to approve the 2018 GASB 67/68 Report.

Segal Consulting

North Dakota Teachers' Fund for Retirement

Governmental Accounting Standards Board Statement Nos 67 and 68 Actuarial Valuation as of July 1, 2018

This report has been prepared at the request of the Board of Trustees to assist the sponsors of the Fund in preparing their financial report for liabilities associated with the Fund. The measurements shown in this actuarial valuation may not be applicable for other purposes.

Segal Consulting
101 North Wacker Drive, Suite 500 Chicago, IL 60606
T 312.984.8500 www.segalco.com

November 5, 2018

Board of Trustees
North Dakota Teachers' Fund for Retirement
3442 East Century Avenue
Bismarck, ND 58507-7100

Dear Board Members:

We are pleased to submit the following report intended to be used for satisfying certain reporting requirements by Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68 as of June 30, 2018.

This report was prepared in accordance with generally accepted actuarial principles and practices. The census and financial information on which our calculations were based was supplied by the staff of the Retirement and Investment Office. That assistance is gratefully acknowledged. The actuarial calculations were completed under the supervision of Matthew Strom, FSA, MAAA, Enrolled Actuary.

The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and changes in plan provisions or applicable law.

We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and expectations for the Fund.

We look forward to reviewing this report with you and to answering any questions.

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By: Kim Nicholl
Kim Nicholl
Senior Vice President and Actuary

Matthew A. Strom
Matthew Strom, FSA, MAAA, EA
Vice President and Actuary

Table of Contents

Section 1: Actuarial Valuation Summary

Section 2: GASB 67 and 68 Information

Section 3: Additional Information for GASB 68

Section 1: Actuarial Valuation Summary

Purpose

This report has been prepared by Segal Consulting to present certain disclosure information required by Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68 as of June 30, 2018. This valuation is based on:

- The benefit provisions set forth in the North Dakota Century Code, as administered by the TFFR Board of Trustees;
- The characteristics of covered active members, terminated vested members, and retired members and beneficiaries as of July 1, 2018, provided by the North Dakota Retirement and Investment Office;
- The assets of the Fund as of June 30, 2018, provided by the North Dakota Retirement and Investment Office;
- Economic assumptions regarding future salary increases and investment earnings adopted by the Board; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc.

Valuation Comments

The following are key observations regarding this actuarial valuation:

- Governmental Accounting Standards Board (GASB) Statements 67 and 68 contain rules for the reporting of pension liabilities for accounting purposes. Statement 67 was effective with the fiscal year ending June 30, 2014, for Plan reporting. Statement 68 was effective with the fiscal year ending June 30, 2015, for employer reporting. The information contained in this valuation is intended to be used (along with other information) in order to comply with both Statements 67 and 68.
- It is important to note that the GASB rules only redefine pension liability and expense for financial reporting purposes, and do not apply to contribution amounts for actual pension funding purposes. Plans can still develop and adopt funding policies under current practices.
- When measuring pension liability for GASB purposes, the same actuarial cost method (Entry Age method) is used to determine the funded status of the Plan, the actuarially determined contribution rate, and the effective amortization period. In addition, the GASB blended discount rate calculation results in the same discount rate (expected return on assets) as used for funding purposes. This

means that the Total Pension Liability (TPL) measure for financial reporting shown in this report is determined on the same basis as the Actuarial Accrued Liability (AAL) measure for funding.

- The net pension liability (NPL) is equal to the difference between the TPL and the Plan Fiduciary Net Position. The Plan Fiduciary Net Position is equal to the market value of assets and therefore, the NPL measure is very similar to an Unfunded Actuarial Accrued Liability (UAAL) on a market value basis. The NPL decreased from $1.37 billion as of June 30, 2017, to $1.33 billion as of June 30, 2018, primarily as a result of favorable investment results for the fiscal year ending June 30, 2018. Changes in these values during the prior fiscal year ending June 30, 2018, can be found in Exhibit 3.
- The discount rate used to determine the TPL and NPL was 7.75% as of both June 30, 2018 and June 30, 2017. The detailed calculations used in this derivation are shown in Section 2, Exhibits 7 and 8 of this report.

Summary of Key Valuation Results

	2018	2017
Disclosure elements for fiscal year ending June 30:		
Service cost	$78,041,335	$75,476,063
Total Pension Liability	3,863,515,726	3,734,016,828
Plan Fiduciary Net Position	2,530,657,411	2,360,491,075
Net Pension Liability	1,332,858,315	1,373,525,753
Pension fiduciary net position as a percentage of total pension liability	65.5%	63.2%
Schedule of contributions for fiscal year ending June 30:		
Actuarially determined contributions	$88,307,239	$89,231,211
Actual contributions	86,675,715	86,058,868
Contribution deficiency / (excess)	1,631,524	3,172,343
Demographic data for plan year ending June 30:		
Number of retired members and beneficiaries	8,743	8,501
Number of vested terminated members	1,623	1,600
Number of inactive non-vested members	971	878
Number of active members	10,881	10,874
Key assumptions as of June 30:		
Investment rate of return	7.75%	7.75%
Municipal Bond Index	3.87%	3.58%
Inflation rate	2.75%	2.75%
Projected salary increases	4.25% to 14.50% varying by service	4.25% to 14.50% varying by service

Important Information about Actuarial Valuations

In order to prepare an actuarial valuation, Segal Consulting (“Segal”) relies on a number of input items. These include:

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our funding valuation report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by TFFR. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the market value of assets as of the valuation date, as provided by TFFR.
Actuarial assumptions	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan’s assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.

The user of Segal’s actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The valuation is prepared at the request of TFFR to assist the sponsors of the Fund in preparing items related to the pension plan in their financial reports. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement of the plan’s assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.
- If TFFR is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal’s valuation is based on our understanding of applicable guidance in these areas and of the plan’s provisions, but they may be subject to alternative interpretations. TFFR should look to their other advisors for expertise in these areas.

As Segal Consulting has no discretionary authority with respect to the management or assets of TFFR, it is not a fiduciary in its capacity as actuaries and consultants with respect to TFFR.

Section 2: GASB 67 and 68 Information

Exhibit 1 - Membership Data

	July 1, 2018	July 1, 2017
Retired members and beneficiaries	8,743	8,501
Vested inactive members	1,623	1,600
Non-Vested inactive members	971	878
Active members		
Vested	7,696	7,543
Non-Vested	3,185	3,331
Total active members	10,881	10,874
Total membership	22,218	21,853

Active Membership By Plan Eligibility

	July 1, 2018	July 1, 2017
Tier 1 Grandfathered	1,889	2,221
Tier 1 Non-Grandfathered	3,180	3,237
Tier 2	5,812	5,416
Total Active membership	10,881	10,874

Exhibit 2 - Net Pension Liability

	July 1, 2018	July 1, 2017
Components of the Net Pension Liability		
Total Pension Liability	$3,863,515,726	$3,734,016,828
Plan Fiduciary Net Position	(2,530,657,411)	(2,360,491,075)
Net Pension Liability	1,332,858,315	1,373,525,753
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	65.5%	63.2%

Plan provisions. The plan provisions used in the measurement of the net pension liability are the same as those used in the actuarial valuation as of July 1, 2018.

Actuarial assumptions. The total pension liability as of June 30, 2018, which was measured by an actuarial valuation as of July 1, 2018, used the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	2.75%
Salary increases	4.25% to 14.25%, verying by service, including inflation and productivity
Investment rate of return	7.75%, net of pension plan investment expense
Cost-of-living adjustments	None

For active and inactive members, mortality rates were based on the RP-2014 Employee Mortality Table, projected generationally using Scale MP-2014. For healthy retirees, mortality rates were based on the RP-2014 Healthy Annuitant Mortality Table set back one year, multiplied by 50% for ages under 75 and grading up to 100% by age 80, projected generationally using Scale MP-2014. For disability retirees, mortality rates were based on the RP-2014 Disabled Mortality Table set forward four years.

The actuarial assumptions used were based on the results of an experience study dated April 30, 2015. They are the same as the assumptions used in the July 1, 2018, funding actuarial valuation for TFFR.

Exhibit 3 - Target Asset Allocation

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the pension plan's target asset allocation as of July 1, 2018 are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*
Global Equities	58%	6.7%
Global Fixed Income	23%	1.5%
Global Real Assets	18%	5.1%
Cash Equivalents	1%	0.0%
Total	100%	

*As reported by the North Dakota Retirement and Investment Office.

Discount rate: The long-term expected rate of return on pension plan investments is 7.75%. The high quality tax-exempt general obligation municipal bond rate (20-Bond GO Index) as of the closest date prior to the valuation date of June 30, 2018, is 3.87%, as published by the Board of Governors of the Federal Reserve System.

The discount rate used to measure the total pension liability was 7.75% as of June 30, 2018. The projection of cash flows used to determine the discount rate assumed plan member and employer contributions will be made at rates equal to those based on the July 1, 2018, Actuarial Valuation Report. For this purpose, only employer contributions that are intended to fund benefits of current plan members and their beneficiaries are included. Projected employer contributions that are intended to fund the service costs of future plan members and their beneficiaries, as well as projected contributions from future plan members, are not included. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members as of June 30, 2018. Therefore, as shown in Exhibits 7 and 8, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability as of June 30, 2018.

Exhibit 4 - Discount Rate Sensitivity

Sensitivity of the net pension liability to changes in the discount rate. The following presents the net pension liability of the TFFR as of June 30, 2018 and June 30, 2017, calculated using the discount rate of 7.75%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.75%) or 1-percentage-point higher (8.75%) than the current rate.

Net Pension Liability	1% Decrease (6.75%)	Current Discount Rate (7.75%)	1% Increase (8.75%)
Net pension liability as of June 30, 2018	$1,799,744,383	$1,332,858,315	$944,554,161
Net pension liability as of June 30, 2017	$1,826,126,843	$1,373,525,753	$996,748,988

Exhibit 5 - Schedule of Changes in Net Pension Liability

	2018	2017
Total Pension Liability		
Service cost	$78,041,335	$75,476,063
Interest	287,375,333	276,412,402
Change of benefit terms	0	0
Differences between expected and actual experience	(27,939,071)	(10,748,944)
Changes of assumptions	0	0
Benefit payments, including refunds of member contributions	(207,978,699)	(196,516,544)
Net change in Total Pension Liability	$129,498,898	$144,622,977
Total Pension Liability – beginning	3,734,016,828	3,589,393,851
Total Pension Liability – ending	$3,863,515,726	$3,734,016,828
Plan Fiduciary Net Position		
Contributions – employer	$86,675,715	$86,058,868
Contributions – employee	79,877,611	79,309,153
Contributions – member	2,181,106	2,553,200
Contributions – other	194,028	235,890
Net investment income	211,345,369	266,688,651
Benefit payments, including refunds of member contributions	(207,978,699)	(196,516,544)
Administrative expense	(2,128,794)	(2,173,431)
Other	0	0
Net change in Plan Fiduciary Net Position	$170,166,336	$236,155,787
Plan Fiduciary Net Position – beginning	2,360,491,075	2,124,335,288
Plan Fiduciary Net Position – ending	$2,530,657,411	$2,360,491,075
Net Pension Liability – ending	$1,332,858,315	$1,373,525,753
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	65.5%	63.2%
Covered employee payroll	$679,809,385	$674,971,342
Plan Net Pension Liability as percentage of covered employee payroll	196.1%	203.5%

Exhibit 6 - Schedule of Employer Contributions

Year Ended June 30	Actuarially Determined Contributions	Contributions in Relation to the Actuarially Determined Contributions	Contribution Deficiency / (Excess)	Covered-Employee Payroll	Contributions as a Percentage of Covered Employee Payroll
2013	$52,396,153	$59,300,720	($6,904,567)	$551,655,590	10.75%
2014	59,513,485	62,355,146	(2,841,661)	580,053,235	10.75%
2015	71,167,632	78,422,098	(7,254,466)	615,104,860	12.75%
2016	84,724,122	82,839,932	1,884,190	649,724,868	12.75%
2017	89,231,211	86,058,868	3,172,343	674,971,342	12.75%
2018	88,307,239	86,675,715	1,631,524	679,809,385	12.75%

Notes to Exhibit 6

Methods and assumptions used to establish "actuarially determined contribution" rates:

Valuation date	Actuarially determined contribution rates are calculated as of June 30, with appropriate interest to the middle of the fiscal year.
Actuarial cost method	Entry Age Actuarial Cost Method
Amortization method	Level percentage of pay, closed
Remaining amortization period	25 years as of July 1, 2018 The amortization of unfunded actuarial accrued liability (UAAL) within the actuarially determined contribution rate calculation is based on the level percentage of pay required to amortize the UAAL over the 30-year closed period that began July 1, 2013. For this calculation, payroll is assumed to increase 3.25% per year.
Asset valuation method	The market value of assets with a five-year phase-in of actual 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).
Actuarial assumptions:	
Investment rate of return	7.75%, net of pension plan investment expense
Inflation rate	2.75%
Projected salary increases	4.25% to 14.50%, varying by service, includes inflation and productivity
Mortality*	Post-retirement Non-Disabled: RP-2014 Healthy Annuitant Mortality Table set back one year, multiplied by 50% for ages under 75 and grading up to 100% by age 80, projected generationally using Scale MP-2014. Pre-retirement Non-Disabled: RP-2014 Employee Mortality Table, projected generationally using Scale MP-2014. Disabled: RP-2014 Disabled Mortality table set forward 4 years.
Other assumptions	Same as those used in the July 1, 2018, and July 1, 2017, actuarial funding valuations.

*The mortality rates were based on historical and current demographic data, as used in the experience study dated April 30, 2015. The underlying tables reasonably reflect the mortality experience of the Fund as of the measurement date.

Section 3: Additional Information for GASB 68

Changes in the collective net pension liability from the beginning of the year to the end of the year arise from the net difference between changes in the total pension liability and plan fiduciary net position that occurred during the year. Changes in net pension liability will be recognized immediately as pension expense, or reported as deferred outflows of resources related to pensions or deferred inflows of resources related to pensions, depending on the nature of the change.

Differences between actual and expected investment-related experience are recognized over a closed five-year period. Differences between actual and expected non-investment-related experience and changes of assumptions are recognized over the average of the expected remaining service lives of all members who are provided with pensions through the pension plan (active employees and inactive employees). The amounts below that are not included in pension expense for the current year are included in deferred outflows of resources or deferred inflows of resources related to pensions.

Exhibit A - Reconciliation of Collective Net Pension Liability

	Increase/(Decrease) For Fiscal year Ending June 30, 2018		
	Total Pension Liability (a)	**Plan Fiduciary Net Position (b)**	**Net Pension Liability (a) – (b)**
Balance at the beginning of the year	$3,734,016,828	$2,360,491,075	$1,373,525,753
Changes for the year			
• Service cost	$78,041,335		$78,041,335
• Interest	287,375,333		287,375,333
• Differences between expected and actual experience	(27,939,071)		(27,939,071)
• Contributions – employer		86,675,715	(86,675,715)
• Contributions – member		79,877,611	(79,877,611)
• Contributions – purchased service credit		2,181,106	(2,181,106)
• Contributions – other		194,028	(194,028)
• Net Investment income		211,345,369	(211,345,369)
• Benefit payments, including refunds of employee contributions	(207,978,699)	(207,978,699)	--
• Administrative expense	--	(2,128,794)	2,128,794
• Change of assumptions	--	--	--
• Change of benefit terms			
Net Change	**129,498,898**	**170,166,336**	**(40,667,438)**
Balances at end of year	**$3,863,515,726**	**$2,530,657,411**	**$1,332,858,315**

As shown in Exhibit A, during the plan year that ended June 30, 2018, the changes in net pension liability due to differences between expected and actual demographic experience is a decrease of $27,939,071. The average expected remaining service lives of all members is 7 years, determined as of July 1, 2017 (the beginning of the measurement period ending June 30, 2018). Therefore, of the $27,939,071 demographic gain, $3,991,296 is recognized in pension expense in the current year and $23,947,775 is reflected as a deferred inflow of resources related to pensions.

Based on the assumed investment return of 7.75%, the expected net investment income for the year was $181,342,371. As shown in Exhibit A, the actual net investment income for the year was $211,345,369. The difference between actual and expected investment experience is a decrease in net pension liability of $30,002,998, which is recognized over a 5-year period. Of this amount, $6,000,600 is reflected in the current year and $24,002,398 is reflected as a deferred inflow of resources related to pensions.

Exhibit B – Collective Deferred Outflow of Resources and Deferred Inflows of Resources Related to Pensions

Employer	Year Established	Original Balance	Original Amortization Period	Amortization Amount During 2018	Outstanding Balance at June 30, 2018
Outflows					
Demographics	2014	$9,347,346	7 years	$1,335,335	$2,670,671
Demographics	2015	2,209,258	7 years	315,608	946,826
Assumptions	2015	171,324,647	7 years	24,474,950	73,424,847
Investments	2015	93,160,436	5 years	18,632,087	18,632,088
Investments	2016	156,759,166	5 years	31,351,833	62,703,667
Total Outflows				**$76,109,813**	**$158,378,099**
Inflows					
Investments	2014	$148,793,866	5 years	$29,758,774	$0
Demographics	2016	8,092,800	7 years	1,156,114	4,624,458
Demographics	2017	10,748,944	7 years	1,535,563	7,677,818
Investments	2017	103,235,815	5 years	20,647,163	61,941,489
Investments	2018	30,002,998	5 years	6,000,600	24,002,398
Demographics	2018	27,939,071	7 years	3,991,296	23,947,775
Total Inflows				**$63,089,510**	**$122,193,938**

Exhibit B – Collective Deferred Outflow of Resources and Deferred Inflows of Resources Related to Pensions (Continued)

	June 30, 2018	June 30, 2017
Deferred Outflows of Resources		
Difference between expected an actual experience in the Total Pension Liability	$3,617,497	$5,268,440
Changes in assumptions	73,424,847	97,899,797
Net difference between projected and actual earning on pension plan investments	0	18,972,249
Total Deferred Outflows of Resources	$77,042,344	$122,140,486
Deferred Inflows of Resources		
Difference between expected and actual experience in the Total Pension Liability	$36,250,051	$14,993,953
Changes of assumptions	0	0
Net difference between projected and actual earning on pension plan investments	4,608,132	0
Total Deferred Inflows of Resources	$40,858,183	$14,993,953

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Year Ended June 30:		
2018		$23,012,199
2019	$42,779,078	52,770,974
2020	24,146,992	34,138,888
2021	(8,540,179)	1,451,717
2022	(12,683,573)	(2,691,679)
2023	(5,526,862)	(1,535,566)
Thereafter	(3,991,295)	0

Exhibit C below shows the individual components of collective pension expense, which totaled $116,970,649 for the fiscal year that ended June 30, 2018.

Annual pension expense for the year can also be viewed as the change in net pension liability, plus employer contributions for the year, less the change in outstanding balances of deferred outflows and deferred inflows of resources from the end of the prior fiscal year to end of the current fiscal year. From Exhibit A, the change in net pension liability during the year was ($40,667,438) and employer contributions were $86,675,715. The net value of deferred outflows and deferred inflows of resources as of the end of the current fiscal year is $36,184,161 compared to the net value as of the end of the prior fiscal of $107,146,533 for a change of ($70,962,372). Therefore, the pension expense for the fiscal year that ended June 30, 2018, is ($40,667,438) + $86,675,715 – ($70,962,372), or $116,970,649.

Exhibit C – Collective Pension Expenses

Components of Pension Expense	Fiscal Year Ending June 30, 2018	Fiscal Year Ending June 30, 2017
Service cost	$78,041,335	$75,476,063
Interest on the Total Pension Liability	287,375,333	276,412,402
Projected earnings on plan investments	(181,342,371)	(163,452,836)
Member contributions	(79,877,611)	(79,309,153)
Contributions – purchased service credit	(2,181,106)	(2,553,200)
Contributions – other	(194,028)	(235,890)
Administrative expense	2,128,794	2,173,431
Current Year recognition of:		
Changes in assumptions	24,474,950	24,474,950
Difference between expected and actual experience	(5,032,030)	(1,040,734)
Difference between projected and actual earnings on pension plan investments	(6,422,617)	(422,016)
Change of benefit terms	0	0
Total pension expense	$116,970,649	$131,523,017

TFFR is classified as a cost-sharing multiple-employer defined benefit pension plan for GASB accounting purposes. As specified in GASB 68, employers that participate in TFFR are required to recognize their proportionate share of the collective pension amounts for all benefits provided through the Fund. Pension amounts to be recognized by employers include the net pension liability, deferred outflows of resources related to pensions, deferred inflows of resources related to pensions, and pension expense. In addition, the effects of (1) a change in the employer's proportion of the collective net pension liability and (2) differences during the measurement period between the employer's contributions and its proportionate share of the total of contributions from employers included in the collective net pension liability are required to be determined and recognized.

The basis of an employer's allocation of the collective pension amounts should be consistent with the manner in which contributions to the plan are determined. Since contributions to TFFR are collected as a percentage of payroll, covered employee payroll for the fiscal year ending June 30, 2018, is used as the proportionate share allocation basis. Retirement and Investment Office staff supplied covered employee payroll for each employer.

The net effect of the change on an employer's proportionate share of the collective net pension liability and collective deferred outflows of resources and deferred inflows of resources is recognized over the average of the expected remaining service lives of all members who are provided with pensions through TFFR.

In addition, the difference between the actual employer contributions and the proportionate share of the employer contributions during the measurement period ended June 30, 2018, is recognized over the same period. However, since TFFR contributions are collected on the same basis as the proportionate share allocation, there is no difference between the actual employer contributions and the proportionate share of the employer contributions. If employers no longer report to TFFR, they will continue to remain on the schedule until their deferral balances are depleted.

Exhibits D and E that follow show the proportionate share information for employers of TFFR for the fiscal year ending
June 30, 2018.

EXHIBIT D

Schedule of Employer Allocations as of June 30, 2018

Employer Name	Covered Employee Payroll	Employer's Proportionate Share Allocation
Alexander School	$ 1,227,517	0.18056775%
Anamoose School	772,592	0.11364838%
Apple Creek Elem School	302,602	0.04451281%
Ashley School	947,234	0.13933825%
Bakker Elem School	41,000	0.00603110%
Barnes County North	1,558,787	0.22929762%
Beach School	2,077,459	0.30559440%
Belcourt School	8,601,906	1.26534089%
Belfield Public School	1,553,219	0.22847865%
Beulah School	3,607,812	0.53070940%
Billings Co. School Dist.	852,837	0.12545235%
Bismarck Public Schools	72,783,129	10.70640246%
Bismarck State College	-	0.00000000%
Blessed John Paul II Catholic Sch Network	-	0.00000000%
Bottineau School	3,784,276	0.55666726%
Bowbells School	606,611	0.08923249%
Bowman School	2,887,045	0.42468449%
Burke Central School	1,041,812	0.15325054%
Burleigh County Spec. Ed.	103,526	0.01522871%
Carrington School	2,938,966	0.43232212%
Cavalier School	2,227,101	0.32760664%
Center Stanton School	1,571,704	0.23119771%
Central Cass School	3,662,940	0.53881875%
Central Elementary School	63,927	0.00940373%
Central Valley School	1,296,725	0.19074831%
Dakota Prairie School	2,026,079	0.29803638%
Devils Lake School	10,218,902	1.50320100%
Dickinson School	20,081,355	2.95396851%
Divide School	2,550,985	0.37525002%
Drake School	465,956	0.06854222%
Drayton School	1,354,524	0.19925057%
Dunseith School	3,287,960	0.48365916%
E Central Ctr Exc Childn	796,018	0.11709433%
Earl Elem. School	33,500	0.00492785%
Edgeley School	1,229,717	0.18089141%
Edmore School	742,367	0.10920229%
Eight Mile School	1,698,568	0.24985946%
Elgin-New Leipzig School	1,192,791	0.17545961%
Ellendale School	1,613,451	0.23733870%
Emerado Elementary School	625,595	0.09202512%
Enderlin Area School District	2,023,274	0.29762369%
Fairmount School	1,030,231	0.15154704%
Fargo Public Schools	70,836,581	10.42006522%
Fessenden-Bowdon School	1,075,610	0.15822226%
Finley-Sharon School	1,022,471	0.15040548%
Flasher School	1,172,590	0.17248808%
Fordville Lankin School	579,430	0.08523418%
Fort Ransom Elem School	161,403	0.02374236%
Fort Totten School	1,387,228	0.20406137%
Fort Yates School	1,097,220	0.16140106%
Gackle-Streeter Pub Sch	802,508	0.11804891%
Garrison School	2,357,896	0.34684666%
Glen Ullin School	1,137,097	0.16726708%
Glenburn School	1,745,787	0.25680541%
Goodrich School	302,319	0.04447109%
Grafton School	4,259,415	0.62656016%
Grand Forks School	47,181,333	6.94037677%
Great North West Cooperative	113,171	0.01664740%
Grenora School	1,185,937	0.17445147%
Griggs County Central Sch	1,661,121	0.24435096%

EXHIBIT D

Schedule of Employer Allocations as of June 30, 2018

Employer Name	Covered Employee Payroll	Employer's Proportionate Share Allocation
Gst Educational Services	1,761,354	0.25909526%
Halliday School	264,603	0.03892312%
Hankinson School	1,522,883	0.22401612%
Harvey School	2,303,500	0.33884492%
Hatton Eielson Psd	1,123,556	0.16527508%
Hazelton - Moffit School	805,316	0.11846208%
Hazen School	2,996,978	0.44085570%
Hebron School	1,197,665	0.17617659%
Hettinger School	1,384,703	0.20368983%
Hillsboro School	2,644,524	0.38900961%
Hope School	700,555	0.10305170%
Horse Creek Elem. School	38,600	0.00567807%
James River Multidistrict Spec Ed Unit	1,481,006	0.21785610%
Jamestown School	13,385,750	1.96904464%
Kenmare School	1,807,522	0.26588652%
Kensal School	291,469	0.04287513%
Kidder County School District	2,159,696	0.31769148%
Killdeer School	2,882,595	0.42402996%
Kindred School	3,394,364	0.49931117%
Kulm School	1,046,528	0.15394432%
Lake Region Spec Ed	1,817,811	0.26740003%
Lakota School	1,272,940	0.18724953%
Lamoure School	1,521,158	0.22376237%
Langdon Area School	2,345,033	0.34495448%
Larimore School	2,232,051	0.32833476%
Leeds School	1,064,427	0.15657723%
Lewis And Clark School	2,609,285	0.38382604%
Lidgerwood School	1,124,160	0.16536401%
Linton School	1,650,803	0.24283323%
Lisbon School	3,586,333	0.52754979%
Litchville-Marion School	789,247	0.11609835%
Little Heart Elem. School	132,868	0.01954490%
Logan County	4,079	0.00060006%
Lone Tree Elem. School	238,118	0.03502717%
Lonetree Spec Ed Unit	214,377	0.03153487%
Maddock School	912,861	0.13428188%
Mandan Public Schools	20,215,366	2.97368147%
Mandaree School	1,444,294	0.21245574%
Manning Elem School	104,242	0.01533395%
Manvel Elem. School	841,787	0.12382697%
Maple Valley School	1,674,845	0.24636978%
Mapleton Elem. School	800,512	0.11775542%
Marmarth Elem. School	105,287	0.01548778%
Max School	1,169,297	0.17200368%
May-Port C-G School	2,759,358	0.40590166%
Mcclusky School	560,922	0.08251161%
Mckenzie County	44,073	0.00648319%
Mckenzie County School	7,584,854	1.11573250%
Medina School	1,066,599	0.15689684%
Menoken Elem School	195,538	0.02876365%
Midkota	1,061,295	0.15611651%
Midway School	1,285,118	0.18904094%
Milnor School	1,474,895	0.21695721%
Minnewaukan School	1,749,421	0.25733996%
Minot School	44,503,060	6.54640276%
Minto School	1,281,549	0.18851589%
Mohall Lansford Sherwood	2,106,133	0.30981232%
Montpelier School	781,122	0.11490306%
Morton County	10,175	0.00149672%
Mott-Regent School	1,414,419	0.20806113%

EXHIBIT D

Schedule of Employer Allocations as of June 30, 2018

Employer Name	Covered Employee Payroll	Employer's Proportionate Share Allocation
Mt Pleasant School	1,612,121	0.23714302%
Munich School	1,019,447	0.14996072%
N Central Area Career And Tech Center	-	0.00000000%
Napoleon School	1,556,132	0.22890714%
Naughton Rural School	94,743	0.01393664%
Nd Center For Distance Education	1,370,228	0.20156057%
Nd Dept Of Public Instruction	265,274	0.03902183%
Nd School For Blind	718,703	0.10572125%
Nd School For Deaf	950,591	0.13983196%
Nd United	324,961	0.04780184%
Nd Youth Correctional Cnt	1,221,312	0.17965509%
Nedrose School	2,755,718	0.40536633%
Nelson County	13,127	0.00193100%
Nesson School	1,800,693	0.26488198%
New England School	1,429,491	0.21027815%
New Rockford Sheyenne School	1,731,675	0.25472949%
New Salem-Almont	1,946,197	0.28628567%
New Town School	4,966,161	0.73052258%
Newburg United District	764,066	0.11239422%
North Border School	2,728,317	0.40133553%
North Sargent School	1,603,875	0.23593013%
North Star	1,705,297	0.25084927%
North Valley Area Career	564,266	0.08300355%
Northern Cass School Dist	3,208,659	0.47199386%
Northern Plains Spec Ed	316,851	0.04660873%
Northwood School	1,641,959	0.24153232%
Oakes School	2,112,497	0.31074840%
Oberon Elem School	353,671	0.05202499%
Oliver - Mercer Spec Ed	958,458	0.14098916%
Page School	661,141	0.09725391%
Park River Area School District	2,090,534	0.30751766%
Parshall School	1,868,579	0.27486804%
Peace Garden Spec Ed	596,955	0.08781211%
Pembina Spec Ed Coop	124,132	0.01825987%
Pingree - Buchanan School	838,869	0.12339769%
Pleasant Valley Elem	-	0.00000000%
Powers Lake School	1,168,526	0.17189030%
Richardton-Taylor	1,821,633	0.26796227%
Richland School	1,514,323	0.22275701%
Robinson School	-	0.00000000%
Rolette County	-	0.00000000%
Rolette School	1,263,823	0.18590847%
Roosevelt School	390,943	0.05750780%
Roughrider Area Career And Tech Center	138,650	0.02039542%
Roughrider Service Program	259,052	0.03810651%
Rugby School	3,341,580	0.49154668%
Rural Cass Spec Ed	1,210,871	0.17811925%
Sargent Central School	1,617,334	0.23790992%
Sawyer School	517,145	0.07607208%
Scranton School	1,157,038	0.17020042%
Se Region Career And Tech	1,511,205	0.22229832%
Selfridge School	941,682	0.13852148%
Sheyenne Valley Area Voc	775,994	0.11414881%
Sheyenne Valley Spec Ed	1,524,122	0.22419840%
Slope County	25,972	0.00382044%
Solen - Cannonball School	1,598,170	0.23509096%
Souris Valley Spec Ed	1,154,005	0.16975418%
South Cent. Prairie Sp Ed	58,055	0.00853989%
South East Education Cooperative	530,039	0.07796883%
South Heart School	1,772,898	0.26079340%

EXHIBIT D

Schedule of Employer Allocations as of June 30, 2018

Employer Name	Covered Employee Payroll	Employer's Proportionate Share Allocation
South Prairie School District	2,428,054	0.35716686%
South Valley Spec Ed	484,962	0.07133794%
Southwest Special Education Unit	67,336	0.00990513%
St. John'S School	2,643,349	0.38883679%
St. Thomas School	598,062	0.08797495%
Stanley School	3,717,787	0.54688673%
Starkweather School	494,694	0.07276950%
Sterling School	292,871	0.04308130%
Strasburg School District	958,480	0.14099243%
Surrey School	2,521,869	0.37096713%
Sweet Briar Elem School	111,900	0.01646050%
Tgu School District	2,590,959	0.38113016%
Thompson School	2,367,880	0.34831521%
Tioga School	3,162,934	0.46526784%
Turtle Lake-Mercer School	1,318,614	0.19396820%
Twin Buttes Elem. School	450,991	0.06634080%
Underwood School	1,510,583	0.22220685%
United School	3,357,843	0.49393886%
Upper Valley Spec Ed	2,629,016	0.38672835%
Valley - Edinburg School	1,625,781	0.23915244%
Valley City School	6,126,995	0.90128138%
Velva School	2,676,715	0.39374499%
Wahpeton School	6,605,525	0.97167313%
Ward County	29,401	0.00432495%
Warwick School	1,544,703	0.22722592%
Washburn School	1,758,128	0.25862070%
West Fargo School	60,539,948	8.90542987%
West River Student Services	608,558	0.08951892%
Westhope School	1,062,194	0.15624880%
White Shield School	1,442,649	0.21221378%
Williams Co School Dist #8	2,146,468	0.31574563%
Williston School	19,254,823	2.83238560%
Wilmac Special Education	3,763,024	0.55354108%
Wilton School	1,345,217	0.19788155%
Wing School	711,162	0.10461196%
Wishek School	1,300,442	0.19129513%
Wolford School	560,250	0.08241280%
Wyndmere School	1,344,948	0.19784197%
Yellowstone Elem. School	495,268	0.07285397%
Zeeland School	447,243	0.06578945%
Grand Totals:	**679,809,385**	**100%**

EXHIBIT E
Schedule of Pension Amounts by Employer as of June 30, 2018

				Discount Rate Sensitivity			Schedule of Contributions				Pension Expense		
Employer Name	Employer's Proportionate Share Allocation	Net Pension Liability	Covered Employee Payroll	1% Decrease (6.75%)	Current Discount Rate (7.75%)	1% Increase (8.75%)	Statutory Required Contribution	Contributions In Relation to the Statutory Required Contribution	Contribution Deficiency/ (Excess)	Contributions as a Percentage of Covered Employee Payroll	Proportionate Share of Plan Pension Expense	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Employer Pension Expense
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Alexander School	0.18056775%	$ 2,406,712	$ 1,227,517	$ 3,249,758	$ 2,406,712	$ 1,705,560	$ 156,508	$ (156,508)	$ -	12.75%	$ 211,211	$ 62,258	$ 273,469
Anamoose School	0.11364838%	1,514,772	772,592	2,045,380	1,514,772	1,073,471	98,506	(98,506)	-	12.75%	132,935	11,765	144,700
Apple Creek Elem School	0.04451281%	593,293	302,602	801,117	593,293	420,448	38,582	(38,582)	-	12.75%	52,067	(24,115)	27,952
Ashley School	0.13933825%	1,857,181	947,234	2,507,732	1,857,181	1,316,125	120,772	(120,772)	-	12.75%	162,985	(20,452)	142,533
Bakker Elem School	0.00603110%	80,386	41,000	108,544	80,386	56,967	5,227	(5,227)	-	12.75%	7,055	510	7,565
Barnes County North	0.22929762%	3,056,212	1,558,787	4,126,771	3,056,212	2,165,840	198,745	(198,745)	-	12.75%	268,211	(102,582)	165,629
Beach School	0.30559440%	4,073,140	2,077,459	5,499,918	4,073,140	2,886,505	264,876	(264,876)	-	12.75%	357,456	(83,520)	273,936
Belcourt School	1.26534089%	16,865,201	8,601,906	22,772,902	16,865,201	11,951,830	1,096,743	(1,096,743)	-	12.75%	1,480,077	(127,093)	1,352,984
Belfield Public School	0.22847865%	3,045,297	1,553,219	4,112,032	3,045,297	2,158,105	198,036	(198,036)	-	12.75%	267,253	16,130	283,383
Beulah School	0.53070940%	7,073,604	3,607,812	9,551,413	7,073,604	5,012,838	459,996	(459,996)	-	12.75%	620,774	(42,713)	578,061
Billings Co. School Dist.	0.12545235%	1,672,102	852,837	2,257,822	1,672,102	1,184,965	108,737	(108,737)	-	12.75%	146,742	279	147,021
Bismarck Public Schools	10.70640246%	142,701,175	72,783,129	192,687,877	142,701,175	101,127,770	9,279,851	(9,279,851)	-	12.75%	12,523,348	104,223	12,627,571
Bismarck State College	0.00000000%	-	-	-	-	-	-	-	-	12.75%	-	(8,930)	(8,930)
Blessed John Paul II Catholic Sch Network	0.00000000%	-	-	-	-	-	-	-	-	12.75%	-	(8,788)	(8,788)
Bottineau School	0.55666726%	7,419,586	3,784,276	10,018,588	7,419,586	5,258,024	482,495	(482,495)	-	12.75%	651,137	(83,375)	567,762
Bowbells School	0.08923249%	1,189,343	606,611	1,605,957	1,189,343	842,849	77,343	(77,343)	-	12.75%	104,376	3,269	107,645
Bowman School	0.42468449%	5,660,443	2,887,045	7,643,235	5,660,443	4,011,375	368,098	(368,098)	-	12.75%	496,756	(35,568)	461,188
Burke Central School	0.15325054%	2,042,613	1,041,812	2,758,118	2,042,613	1,447,534	132,831	(132,831)	-	12.75%	179,258	17,236	196,494
Burleigh County Spec. Ed.	0.01522871%	202,977	103,526	274,078	202,977	143,843	13,200	(13,200)	-	12.75%	17,813	6,201	24,014
Carrington School	0.43232212%	5,762,241	2,938,966	7,780,693	5,762,241	4,083,517	374,718	(374,718)	-	12.75%	505,690	(43,175)	462,515
Cavalier School	0.32760664%	4,366,532	2,227,101	5,896,082	4,366,532	3,094,422	283,955	(283,955)	-	12.75%	383,204	(23,319)	359,885
Center Stanton School	0.23119771%	3,081,538	1,571,704	4,160,968	3,081,538	2,183,788	200,392	(200,392)	-	12.75%	270,433	7,497	277,930
Central Cass School	0.53881875%	7,181,691	3,662,940	9,697,360	7,181,691	5,089,435	467,025	(467,025)	-	12.75%	630,260	(54,894)	575,366
Central Elementary School	0.00940373%	125,338	63,927	169,243	125,338	88,823	8,151	(8,151)	-	12.75%	11,000	(1,763)	9,237
Central Valley School	0.19074831%	2,542,405	1,296,725	3,432,982	2,542,405	1,801,721	165,332	(165,332)	-	12.75%	223,120	(30,433)	192,687
Dakota Prairie School	0.29803638%	3,972,403	2,026,079	5,363,893	3,972,403	2,815,115	258,325	(258,325)	-	12.75%	348,615	26,906	375,521
Devils Lake School	1.50320100%	20,035,540	10,218,902	27,053,776	20,035,540	14,198,548	1,302,910	(1,302,910)	-	12.75%	1,758,304	(353,748)	1,404,556
Dickinson School	2.95396851%	39,372,215	20,081,355	53,163,882	39,372,215	27,901,832	2,560,373	(2,560,373)	-	12.75%	3,455,276	610,636	4,065,912
Divide School	0.37525002%	5,001,551	2,550,985	6,753,541	5,001,551	3,544,440	325,251	(325,251)	-	12.75%	438,932	8,441	447,373
Drake School	0.06854222%	913,571	465,956	1,233,585	913,571	647,418	59,409	(59,409)	-	12.75%	80,174	(38,976)	41,198
Drayton School	0.19925057%	2,655,728	1,354,524	3,586,001	2,655,728	1,882,030	172,702	(172,702)	-	12.75%	233,065	23,851	256,916
Dunseith School	0.48365916%	6,446,491	3,287,960	8,704,629	6,446,491	4,568,423	419,215	(419,215)	-	12.75%	565,739	114,690	680,429
E Central Ctr Exc Childn	0.11709433%	1,560,702	796,018	2,107,399	1,560,702	1,106,019	101,492	(101,492)	-	12.75%	136,966	(21,522)	115,444
Earl Elem. School	0.00492785%	65,681	33,500	88,689	65,681	46,546	4,271	(4,271)	-	12.75%	5,764	(528)	5,236
Edgeley School	0.18089141%	2,411,026	1,229,717	3,255,583	2,411,026	1,708,617	156,789	(156,789)	-	12.75%	211,590	(33,802)	177,788
Edmore School	0.10920229%	1,455,512	742,367	1,965,362	1,455,512	1,031,475	94,652	(94,652)	-	12.75%	127,735	(726)	127,009
Eight Mile School	0.24985946%	3,330,273	1,698,568	4,496,832	3,330,273	2,360,058	216,567	(216,567)	-	12.75%	292,262	75,327	367,589
Elgin-New Leipzig School	0.17545961%	2,338,628	1,192,791	3,157,824	2,338,628	1,657,311	152,081	(152,081)	-	12.75%	205,236	17,614	222,850
Ellendale School	0.23733870%	3,163,389	1,613,451	4,271,490	3,163,389	2,241,793	205,715	(205,715)	-	12.75%	277,617	(97,464)	180,153
Emerado Elementary School	0.09202512%	1,226,564	625,595	1,656,217	1,226,564	869,227	79,763	(79,763)	-	12.75%	107,642	851	108,493
Enderlin Area School District	0.29762369%	3,966,902	2,023,274	5,356,466	3,966,902	2,811,217	257,967	(257,967)	-	12.75%	348,132	(22,712)	325,420
Fairmount School	0.15154704%	2,019,907	1,030,231	2,727,459	2,019,907	1,431,444	131,354	(131,354)	-	12.75%	177,266	(16,724)	160,542
Fargo Public Schools	10.42006522%	138,884,706	70,836,581	187,534,539	138,884,706	98,423,160	9,031,666	(9,031,666)	-	12.75%	12,188,418	(802,978)	11,385,440
Fessenden-Bowdon School	0.15822226%	2,108,879	1,075,610	2,847,596	2,108,879	1,494,495	137,140	(137,140)	-	12.75%	185,074	7,679	192,753
Finley-Sharon School	0.15040548%	2,004,692	1,022,471	2,706,914	2,004,692	1,420,661	130,365	(130,365)	-	12.75%	175,930	(62,324)	113,606
Flasher School	0.17248808%	2,299,022	1,172,590	3,104,345	2,299,022	1,629,243	149,505	(149,505)	-	12.75%	201,760	(13,929)	187,831
Fordville Lankin School	0.08523418%	1,136,051	579,430	1,533,997	1,136,051	805,083	73,877	(73,877)	-	12.75%	99,699	(14,488)	85,211
Fort Ransom Elem School	0.02374236%	316,452	161,403	427,302	316,452	224,259	20,579	(20,579)	-	12.75%	27,772	(4,197)	23,575
Fort Totten School	0.20406137%	2,719,849	1,387,228	3,672,583	2,719,849	1,927,470	176,872	(176,872)	-	12.75%	238,692	(102,938)	135,754
Fort Yates School	0.16140106%	2,151,247	1,097,220	2,904,807	2,151,247	1,524,520	139,896	(139,896)	-	12.75%	188,792	(26,619)	162,173
Gackle-Streeter Pub Sch	0.11804891%	1,573,425	802,508	2,124,579	1,573,425	1,115,036	102,320	(102,320)	-	12.75%	138,083	(8,585)	129,498
Garrison School	0.34684666%	4,622,975	2,357,896	6,242,353	4,622,975	3,276,155	300,632	(300,632)	-	12.75%	405,709	(8,017)	397,692
Glen Ullin School	0.16726708%	2,229,433	1,137,097	3,010,380	2,229,433	1,579,928	144,980	(144,980)	-	12.75%	195,653	(6,758)	188,895
Glenburn School	0.25680541%	3,422,852	1,745,787	4,621,841	3,422,852	2,425,666	222,588	(222,588)	-	12.75%	300,387	(3,960)	296,427
Goodrich School	0.04447109%	592,737	302,319	800,366	592,737	420,054	38,546	(38,546)	-	12.75%	52,018	(5,278)	46,740
Grafton School	0.62656016%	8,351,159	4,259,415	11,276,481	8,351,159	5,918,200	543,075	(543,075)	-	12.75%	732,891	(110,712)	622,179
Grand Forks School	6.94037677%	92,505,389	47,181,333	124,909,041	92,505,389	65,555,618	6,015,621	(6,015,621)	-	12.75%	8,118,204	(440,009)	7,678,195
Great North West Cooperative	0.01664740%	221,886	113,171	299,611	221,886	157,244	14,429	(14,429)	-	12.75%	19,473	(10,144)	9,329
Grenora School	0.17445147%	2,325,191	1,185,937	3,139,681	2,325,191	1,647,789	151,207	(151,207)	-	12.75%	204,057	12,018	216,075
Griggs County Central Sch	0.24435096%	3,256,852	1,661,121	4,397,693	3,256,852	2,308,027	211,793	(211,793)	-	12.75%	285,819	(77,667)	208,152

EXHIBIT E
Schedule of Pension Amounts by Employer as of June 30, 2018

				Discount Rate Sensitivity			Schedule of Contributions				Pension Expense		
Employer Name	Employer's Proportionate Share Allocation	Net Pension Liability	Covered Employee Payroll	1% Decrease (6.75%)	Current Discount Rate (7.75%)	1% Increase (8.75%)	Statutory Required Contribution	Contributions In Relation to the Statutory Required Contribution	Contribution Deficiency/ (Excess)	Contributions as a Percentage of Covered Employee Payroll	Proportionate Share of Plan Pension Expense	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Employer Pension Expense
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Gst Educational Services	0.25909526%	3,453,373	1,761,354	4,663,052	3,453,373	2,447,295	224,573	(224,573)	-	12.75%	303,065	18,543	321,608
Halliday School	0.03892312%	518,790	264,603	700,517	518,790	367,650	33,737	(33,737)	-	12.75%	45,529	(57,814)	(12,285)
Hankinson School	0.22401612%	2,985,817	1,522,883	4,031,718	2,985,817	2,115,954	194,168	(194,168)	-	12.75%	262,033	(72,250)	189,783
Harvey School	0.33884492%	4,516,323	2,303,500	6,098,342	4,516,323	3,200,574	293,696	(293,696)	-	12.75%	396,349	(37,086)	359,263
Hatton Eielson Psd	0.16527508%	2,202,883	1,123,556	2,974,529	2,202,883	1,561,113	143,253	(143,253)	-	12.75%	193,323	(28,812)	164,511
Hazelton - Moffit School	0.11846208%	1,578,932	805,316	2,132,015	1,578,932	1,118,939	102,678	(102,678)	-	12.75%	138,566	(23,440)	115,126
Hazen School	0.44085570%	5,875,982	2,996,978	7,934,276	5,875,982	4,164,121	382,115	(382,115)	-	12.75%	515,672	(5,896)	509,776
Hebron School	0.17617659%	2,348,184	1,197,665	3,170,728	2,348,184	1,664,083	152,702	(152,702)	-	12.75%	206,075	(20,072)	186,003
Hettinger School	0.20368983%	2,714,897	1,384,703	3,665,896	2,714,897	1,923,961	176,550	(176,550)	-	12.75%	238,257	(102,935)	135,322
Hillsboro School	0.38900961%	5,184,947	2,644,524	7,001,179	5,184,947	3,674,406	337,177	(337,177)	-	12.75%	455,027	40,243	495,270
Hope School	0.10305170%	1,373,533	700,555	1,854,667	1,373,533	973,379	89,321	(89,321)	-	12.75%	120,540	3,135	123,675
Horse Creek Elem. School	0.00567807%	75,681	38,600	102,191	75,681	53,632	4,922	(4,922)	-	12.75%	6,642	(588)	6,054
James River Multidistrict Spec Ed Unit	0.21785610%	2,903,713	1,481,006	3,920,853	2,903,713	2,057,769	188,828	(188,828)	-	12.75%	254,828	38,731	293,559
Jamestown School	1.96904464%	26,244,575	13,385,750	35,437,770	26,244,575	18,598,693	1,706,684	(1,706,684)	-	12.75%	2,303,204	(339,433)	1,963,771
Kenmare School	0.26588652%	3,543,891	1,807,522	4,785,278	3,543,891	2,511,442	230,459	(230,459)	-	12.75%	311,009	(46,535)	264,474
Kensal School	0.04287513%	571,465	291,469	771,643	571,465	404,979	37,162	(37,162)	-	12.75%	50,151	(38,268)	11,883
Kidder County School District	0.31769148%	4,234,377	2,159,696	5,717,635	4,234,377	3,000,768	275,361	(275,361)	-	12.75%	371,606	(82,688)	288,918
Killdeer School	0.42402996%	5,651,719	2,882,595	7,631,455	5,651,719	4,005,193	367,531	(367,531)	-	12.75%	495,991	41,924	537,915
Kindred School	0.49931117%	6,655,110	3,394,364	8,986,325	6,655,110	4,716,264	432,782	(432,782)	-	12.75%	584,048	(6,459)	577,589
Kulm School	0.15394432%	2,051,860	1,046,528	2,770,604	2,051,860	1,454,087	133,432	(133,432)	-	12.75%	180,070	(38,542)	141,528
Lake Region Spec Ed	0.26740003%	3,564,064	1,817,811	4,812,517	3,564,064	2,525,738	231,771	(231,771)	-	12.75%	312,780	(34,343)	278,437
Lakota School	0.18724953%	2,495,771	1,272,940	3,370,013	2,495,771	1,768,673	162,300	(162,300)	-	12.75%	219,027	(12,880)	206,147
Lamoure School	0.22376237%	2,982,435	1,521,158	4,027,151	2,982,435	2,113,557	193,948	(193,948)	-	12.75%	261,736	(30,828)	230,908
Langdon Area School	0.34495448%	4,597,754	2,345,033	6,208,299	4,597,754	3,258,282	298,992	(298,992)	-	12.75%	403,495	19,614	423,109
Larimore School	0.32833476%	4,376,237	2,232,051	5,909,186	4,376,237	3,101,300	284,587	(284,587)	-	12.75%	384,055	(45,623)	338,432
Leeds School	0.15657723%	2,086,953	1,064,427	2,817,990	2,086,953	1,478,957	135,714	(135,714)	-	12.75%	183,149	(27,293)	155,856
Lewis And Clark School	0.38382604%	5,115,857	2,609,285	6,907,888	5,115,857	3,625,445	332,684	(332,684)	-	12.75%	448,964	(40,495)	408,469
Lidgerwood School	0.16536401%	2,204,068	1,124,160	2,976,129	2,204,068	1,561,953	143,330	(143,330)	-	12.75%	193,427	(37,876)	155,551
Linton School	0.24283323%	3,236,623	1,650,803	4,370,377	3,236,623	2,293,691	210,477	(210,477)	-	12.75%	284,044	(49,901)	234,143
Lisbon School	0.52754979%	7,031,491	3,586,333	9,494,548	7,031,491	4,982,993	457,258	(457,258)	-	12.75%	617,078	(44,940)	572,138
Litchville-Marion School	0.11609835%	1,547,427	789,247	2,089,474	1,547,427	1,096,612	100,629	(100,629)	-	12.75%	135,801	(40,450)	95,351
Little Heart Elem. School	0.01954490%	260,506	132,868	351,758	260,506	184,612	16,941	(16,941)	-	12.75%	22,862	5,996	28,858
Logan County	0.00060006%	7,998	4,079	10,800	7,998	5,668	520	(520)	-	12.75%	702	(149)	553
Lone Tree Elem. School	0.03502717%	466,863	238,118	630,400	466,863	330,851	30,360	(30,360)	-	12.75%	40,972	2,284	43,256
Lonetree Spec Ed Unit	0.03153487%	420,315	214,377	567,547	420,315	297,864	27,333	(27,333)	-	12.75%	36,887	13,949	50,836
Maddock School	0.13428188%	1,789,787	912,861	2,416,731	1,789,787	1,268,365	116,390	(116,390)	-	12.75%	157,070	(41,501)	115,569
Mandan Public Schools	2.97368147%	39,634,961	20,215,366	53,518,665	39,634,961	28,088,032	2,577,460	(2,577,460)	-	12.75%	3,478,335	253,058	3,731,393
Mandaree School	0.21245574%	2,831,734	1,444,294	3,823,660	2,831,734	2,006,760	184,148	(184,148)	-	12.75%	248,511	(110,010)	138,501
Manning Elem School	0.01533395%	204,380	104,242	275,972	204,380	144,837	13,291	(13,291)	-	12.75%	17,936	6,296	24,232
Manvel Elem. School	0.12382697%	1,650,438	841,787	2,228,569	1,650,438	1,169,613	107,328	(107,328)	-	12.75%	144,841	(4,537)	140,304
Maple Valley School	0.24636978%	3,283,760	1,674,845	4,434,026	3,283,760	2,327,096	213,543	(213,543)	-	12.75%	288,180	(30,232)	257,948
Mapleton Elem. School	0.11775542%	1,569,513	800,512	2,119,297	1,569,513	1,112,264	102,065	(102,065)	-	12.75%	137,739	18,043	155,782
Marmarth Elem. School	0.01548778%	206,430	105,287	278,740	206,430	146,290	13,424	(13,424)	-	12.75%	18,116	(19,265)	(1,149)
Max School	0.17200368%	2,292,565	1,169,297	3,095,627	2,292,565	1,624,668	149,085	(149,085)	-	12.75%	201,194	(20,453)	180,741
May-Port C-G School	0.40590166%	5,410,094	2,759,358	7,305,192	5,410,094	3,833,961	351,818	(351,818)	-	12.75%	474,786	(20,694)	454,092
Mcclusky School	0.08251161%	1,099,763	560,922	1,484,998	1,099,763	779,367	71,518	(71,518)	-	12.75%	96,514	(75,468)	21,046
Mckenzie County	0.00648319%	86,412	44,073	116,681	86,412	61,237	5,619	(5,619)	-	12.75%	7,583	(4,103)	3,480
Mckenzie County School	1.11573250%	14,871,133	7,584,854	20,080,333	14,871,133	10,538,698	967,069	(967,069)	-	12.75%	1,305,080	591,849	1,896,929
Medina School	0.15689684%	2,091,213	1,066,599	2,823,742	2,091,213	1,481,976	135,991	(135,991)	-	12.75%	183,523	(1,904)	181,619
Menoken Elem School	0.02876365%	383,379	195,538	517,672	383,379	271,688	24,931	(24,931)	-	12.75%	33,645	15,075	48,720
Midkota	0.15611651%	2,080,812	1,061,295	2,809,698	2,080,812	1,474,605	135,315	(135,315)	-	12.75%	182,610	(26,376)	156,234
Midway School	0.18904094%	2,519,648	1,285,118	3,402,254	2,519,648	1,785,594	163,853	(163,853)	-	12.75%	221,122	(72,441)	148,681
Milnor School	0.21695721%	2,891,732	1,474,895	3,904,675	2,891,732	2,049,278	188,049	(188,049)	-	12.75%	253,776	(37,514)	216,262
Minnewaukan School	0.25733996%	3,429,977	1,749,421	4,631,461	3,429,977	2,430,715	223,051	(223,051)	-	12.75%	301,012	(33,592)	267,420
Minot School	6.54640276%	87,254,274	44,503,060	117,818,516	87,254,274	61,834,320	5,674,141	(5,674,141)	-	12.75%	7,657,370	(627,361)	7,030,009
Minto School	0.18851589%	2,512,650	1,281,549	3,392,804	2,512,650	1,780,635	163,397	(163,397)	-	12.75%	220,508	8,559	229,067
Mohall Lansford Sherwood	0.30981232%	4,129,359	2,106,133	5,575,830	4,129,359	2,926,345	268,532	(268,532)	-	12.75%	362,389	(122,471)	239,918
Montpelier School	0.11490306%	1,531,495	781,122	2,067,961	1,531,495	1,085,322	99,593	(99,593)	-	12.75%	134,403	2,052	136,455
Morton County	0.00149672%	19,949	10,175	26,937	19,949	14,137	1,297	(1,297)	-	12.75%	1,751	(5,396)	(3,645)
Mott-Regent School	0.20806113%	2,773,160	1,414,419	3,744,569	2,773,160	1,965,250	180,338	(180,338)	-	12.75%	243,370	(69,640)	173,730

EXHIBIT E

Schedule of Pension Amounts by Employer as of June 30, 2018

				Discount Rate Sensitivity			Schedule of Contributions				Pension Expense		
Employer Name	Employer's Proportionate Share Allocation	Net Pension Liability	Covered Employee Payroll	1% Decrease (6.75%)	Current Discount Rate (7.75%)	1% Increase (8.75%)	Statutory Required Contribution	Contributions In Relation to the Statutory Required Contribution	Contribution Deficiency/ (Excess)	Contributions as a Percentage of Covered Employee Payroll	Proportionate Share of Plan Pension Expense	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Employer Pension Expense
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Mt Pleasant School	0.23714302%	3,160,780	1,612,121	4,267,968	3,160,780	2,239,944	205,545	(205,545)	-	12.75%	277,388	(20,106)	257,282
Munich School	0.14996072%	1,998,764	1,019,447	2,698,910	1,998,764	1,416,460	129,980	(129,980)	-	12.75%	175,410	35,113	210,523
N Central Area Career And Tech Center	0.00000000%	-	-	-	-	-	-	-	-	12.75%	-	(42,724)	(42,724)
Napoleon School	0.22890714%	3,051,008	1,556,132	4,119,743	3,051,008	2,162,152	198,407	(198,407)	-	12.75%	267,754	(17,552)	250,202
Naughton Rural School	0.01393664%	185,756	94,743	250,824	185,756	131,639	12,080	(12,080)	-	12.75%	16,302	4,673	20,975
Nd Center For Distance Education	0.20156057%	2,686,517	1,370,228	3,627,575	2,686,517	1,903,849	174,704	(174,704)	-	12.75%	235,767	82,141	317,908
Nd Dept Of Public Instruction	0.03902183%	520,106	265,274	702,293	520,106	368,582	33,822	(33,822)	-	12.75%	45,644	34,178	79,822
Nd School For Blind	0.10572125%	1,409,114	718,703	1,902,712	1,409,114	998,594	91,635	(91,635)	-	12.75%	123,663	(8,230)	115,433
Nd School For Deaf	0.13983196%	1,863,762	950,591	2,516,618	1,863,762	1,320,789	121,200	(121,200)	-	12.75%	163,562	25	163,587
Nd United	0.04780184%	637,131	324,961	860,311	637,131	451,514	41,433	(41,433)	-	12.75%	55,914	(4,615)	51,299
Nd Youth Correctional Cnt	0.17965509%	2,394,548	1,221,312	3,233,332	2,394,548	1,696,940	155,717	(155,717)	-	12.75%	210,144	(25,913)	184,231
Nedrose School	0.40536633%	5,402,959	2,755,718	7,295,558	5,402,959	3,828,905	351,354	(351,354)	-	12.75%	474,160	305,294	779,454
Nelson County	0.00193100%	25,737	13,127	34,753	25,737	18,239	1,674	(1,674)	-	12.75%	2,259	176	2,435
Nesson School	0.26488198%	3,530,501	1,800,693	4,767,199	3,530,501	2,501,954	229,588	(229,588)	-	12.75%	309,834	58,012	367,846
New England School	0.21027815%	2,802,710	1,429,491	3,784,469	2,802,710	1,986,191	182,260	(182,260)	-	12.75%	245,964	37,666	283,630
New Rockford Sheyenne School	0.25472949%	3,395,183	1,731,675	4,584,480	3,395,183	2,406,058	220,789	(220,789)	-	12.75%	297,959	(43,185)	254,774
New Salem-Almont	0.28628567%	3,815,782	1,946,197	5,152,410	3,815,782	2,704,123	248,140	(248,140)	-	12.75%	334,870	34,524	369,394
New Town School	0.73052258%	9,736,831	4,966,161	13,147,539	9,736,831	6,900,181	633,186	(633,186)	-	12.75%	854,497	139,326	993,823
Newburg United District	0.11239422%	1,498,056	764,066	2,022,809	1,498,056	1,061,624	97,418	(97,418)	-	12.75%	131,468	21,879	153,347
North Border School	0.40133553%	5,349,234	2,728,317	7,223,014	5,349,234	3,790,831	347,860	(347,860)	-	12.75%	469,445	(96,351)	373,094
North Sargent School	0.23593013%	3,144,614	1,603,875	4,246,139	3,144,614	2,228,488	204,494	(204,494)	-	12.75%	275,969	52,512	328,481
North Star	0.25084927%	3,343,465	1,705,297	4,514,646	3,343,465	2,369,407	217,425	(217,425)	-	12.75%	293,420	7,289	300,709
North Valley Area Career	0.08300355%	1,106,320	564,266	1,493,852	1,106,320	784,013	71,944	(71,944)	-	12.75%	97,090	(30,250)	66,840
Northern Cass School Dist	0.47199386%	6,291,009	3,208,659	8,494,683	6,291,009	4,458,238	409,104	(409,104)	-	12.75%	552,094	106,946	659,040
Northern Plains Spec Ed	0.04660873%	621,228	316,851	838,838	621,228	440,245	40,398	(40,398)	-	12.75%	54,519	24,010	78,529
Northwood School	0.24153232%	3,219,284	1,641,959	4,346,964	3,219,284	2,281,404	209,350	(209,350)	-	12.75%	282,522	31,168	313,690
Oakes School	0.31074840%	4,141,836	2,112,497	5,592,677	4,141,836	2,935,187	269,343	(269,343)	-	12.75%	363,484	(27,267)	336,217
Oberon Elem School	0.05202499%	693,419	353,671	936,317	693,419	491,404	45,093	(45,093)	-	12.75%	60,854	(38,354)	22,500
Oliver - Mercer Spec Ed	0.14098916%	1,879,186	958,458	2,537,444	1,879,186	1,331,719	122,203	(122,203)	-	12.75%	164,916	(11,242)	153,674
Page School	0.09725391%	1,296,257	661,141	1,750,322	1,296,257	918,616	84,296	(84,296)	-	12.75%	113,759	(31,030)	82,729
Park River Area School District	0.30751766%	4,098,775	2,090,534	5,534,532	4,098,775	2,904,671	266,543	(266,543)	-	12.75%	359,705	(61,749)	297,956
Parshall School	0.27486804%	3,663,602	1,868,579	4,946,922	3,663,602	2,596,278	238,244	(238,244)	-	12.75%	321,515	(12,171)	309,344
Peace Garden Spec Ed	0.08781211%	1,170,411	596,955	1,580,394	1,170,411	829,433	76,112	(76,112)	-	12.75%	102,714	21,151	123,865
Pembina Spec Ed Coop	0.01825987%	243,378	124,132	328,631	243,378	172,474	15,827	(15,827)	-	12.75%	21,359	(17,401)	3,958
Pingree - Buchanan School	0.12339769%	1,644,716	838,869	2,220,843	1,644,716	1,165,558	106,956	(106,956)	-	12.75%	144,339	(12,920)	131,419
Pleasant Valley Elem	0.00000000%	-	-	-	-	-	-	-	-	12.75%	-	(4,753)	(4,753)
Powers Lake School	0.17189030%	2,291,054	1,168,526	3,093,586	2,291,054	1,623,597	148,987	(148,987)	-	12.75%	201,061	17,046	218,107
Richardton-Taylor	0.26796227%	3,571,557	1,821,633	4,822,636	3,571,557	2,531,049	232,258	(232,258)	-	12.75%	313,437	3,614	317,051
Richland School	0.22275701%	2,969,035	1,514,323	4,009,057	2,969,035	2,104,061	193,076	(193,076)	-	12.75%	260,560	(61,825)	198,735
Robinson School	0.00000000%	-	-	-	-	-	-	-	-	12.75%	-	(20,228)	(20,228)
Rolette County	0.00000000%	-	-	-	-	-	-	-	-	12.75%	-	(1,137)	(1,137)
Rolette School	0.18590847%	2,477,897	1,263,823	3,345,877	2,477,897	1,756,006	161,137	(161,137)	-	12.75%	217,458	13,874	231,332
Roosevelt School	0.05750780%	766,497	390,943	1,034,993	766,497	543,192	49,845	(49,845)	-	12.75%	67,267	(14,352)	52,915
Roughrider Area Career And Tech Center	0.02039542%	271,842	138,650	367,065	271,842	192,646	17,678	(17,678)	-	12.75%	23,857	(11,463)	12,394
Roughrider Service Program	0.03810651%	507,906	259,052	685,820	507,906	359,937	33,029	(33,029)	-	12.75%	44,573	37,185	81,758
Rugby School	0.49154668%	6,551,621	3,341,580	8,846,584	6,551,621	4,642,925	426,052	(426,052)	-	12.75%	574,965	(15,629)	559,336
Rural Cass Spec Ed	0.17811925%	2,374,077	1,210,871	3,205,691	2,374,077	1,682,433	154,386	(154,386)	-	12.75%	208,347	12,662	221,009
Sargent Central School	0.23790992%	3,171,002	1,617,334	4,281,770	3,171,002	2,247,188	206,210	(206,210)	-	12.75%	278,285	18,304	296,589
Sawyer School	0.07607208%	1,013,933	517,145	1,369,103	1,013,933	718,542	65,936	(65,936)	-	12.75%	88,982	(108,533)	(19,551)
Scranton School	0.17020042%	2,268,530	1,157,038	3,063,172	2,268,530	1,607,635	147,522	(147,522)	-	12.75%	199,085	(3,559)	195,526
Se Region Career And Tech	0.22229832%	2,962,922	1,511,205	4,000,802	2,962,922	2,099,728	192,679	(192,679)	-	12.75%	260,024	9,325	269,349
Selfridge School	0.13852148%	1,846,295	941,682	2,493,033	1,846,295	1,308,410	120,064	(120,064)	-	12.75%	162,029	5,769	167,798
Sheyenne Valley Area Voc	0.11414881%	1,521,442	775,994	2,054,387	1,521,442	1,078,197	98,939	(98,939)	-	12.75%	133,521	(2,971)	130,550
Sheyenne Valley Spec Ed	0.22419840%	2,988,247	1,524,122	4,034,998	2,988,247	2,117,675	194,326	(194,326)	-	12.75%	262,246	(51,664)	210,582
Slope County	0.00382044%	50,921	25,972	68,758	50,921	36,086	3,311	(3,311)	-	12.75%	4,469	(173)	4,296
Solen - Cannonball School	0.23509096%	3,133,429	1,598,170	4,231,036	3,133,429	2,220,561	203,767	(203,767)	-	12.75%	274,987	(80,955)	194,032
Souris Valley Spec Ed	0.16975418%	2,262,583	1,154,005	3,055,141	2,262,583	1,603,420	147,136	(147,136)	-	12.75%	198,563	(141,215)	57,348
South Cent. Prairie Sp Ed	0.00853989%	113,825	58,055	153,696	113,825	80,664	7,402	(7,402)	-	12.75%	9,989	(13,344)	(3,355)
South East Education Cooperative	0.07796883%	1,039,214	530,039	1,403,240	1,039,214	736,458	67,580	(67,580)	-	12.75%	91,201	134,361	225,562
South Heart School	0.26079340%	3,476,007	1,772,898	4,693,615	3,476,007	2,463,335	226,045	(226,045)	-	12.75%	305,052	83,201	388,253

EXHIBIT E
Schedule of Pension Amounts by Employer as of June 30, 2018

				Discount Rate Sensitivity			Schedule of Contributions				Pension Expense		
Employer Name	Employer's Proportionate Share Allocation	Net Pension Liability	Covered Employee Payroll	1% Decrease (6.75%)	Current Discount Rate (7.75%)	1% Increase (8.75%)	Statutory Required Contribution	Contributions In Relation to the Statutory Required Contribution	Contribution Deficiency/ (Excess)	Contributions as a Percentage of Covered Employee Payroll	Proportionate Share of Plan Pension Expense	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Employer Pension Expense
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
South Prairie School District	0.35716686%	4,760,528	2,428,054	6,428,091	4,760,528	3,373,634	309,577	(309,577)	-	12.75%	417,780	257,127	674,907
South Valley Spec Ed	0.07133794%	950,834	484,962	1,283,901	950,834	673,825	61,833	(61,833)	-	12.75%	83,444	(60,568)	22,876
Southwest Special Education Unit	0.00990513%	132,021	67,336	178,267	132,021	93,559	8,585	(8,585)	-	12.75%	11,586	(805)	10,781
St. John'S School	0.38883679%	5,182,643	2,643,349	6,998,068	5,182,643	3,672,774	337,027	(337,027)	-	12.75%	454,825	(3,802)	451,023
St. Thomas School	0.08797495%	1,172,581	598,062	1,583,324	1,172,581	830,971	76,253	(76,253)	-	12.75%	102,905	(37,163)	65,742
Stanley School	0.54688673%	7,289,225	3,717,787	9,842,563	7,289,225	5,165,641	474,018	(474,018)	-	12.75%	639,697	107,897	747,594
Starkweather School	0.07276950%	969,914	494,694	1,309,665	969,914	687,347	63,073	(63,073)	-	12.75%	85,119	(39,667)	45,452
Sterling School	0.04308130%	574,213	292,871	775,353	574,213	406,926	37,341	(37,341)	-	12.75%	50,392	13,467	63,859
Strasburg School District	0.14099243%	1,879,229	958,480	2,537,503	1,879,229	1,331,750	122,206	(122,206)	-	12.75%	164,920	3,707	168,627
Surrey School	0.37096713%	4,944,466	2,521,869	6,676,460	4,944,466	3,503,985	321,538	(321,538)	-	12.75%	433,923	6,166	440,089
Sweet Briar Elem School	0.01646050%	219,395	111,900	296,247	219,395	155,478	14,267	(14,267)	-	12.75%	19,254	7,110	26,364
Tgu School District	0.38113016%	5,079,925	2,590,959	6,859,369	5,079,925	3,599,981	330,347	(330,347)	-	12.75%	445,810	(85,697)	360,113
Thompson School	0.34831521%	4,642,548	2,367,880	6,268,783	4,642,548	3,290,026	301,905	(301,905)	-	12.75%	407,427	48,238	455,665
Tioga School	0.46526784%	6,201,361	3,162,934	8,373,632	6,201,361	4,394,707	403,274	(403,274)	-	12.75%	544,227	101,497	645,724
Turtle Lake-Mercer School	0.19396820%	2,585,321	1,318,614	3,490,932	2,585,321	1,832,135	168,123	(168,123)	-	12.75%	226,886	(21,059)	205,827
Twin Buttes Elem. School	0.06634080%	884,229	450,991	1,193,965	884,229	626,625	57,501	(57,501)	-	12.75%	77,599	(15,499)	62,100
Underwood School	0.22220685%	2,961,702	1,510,583	3,999,155	2,961,702	2,098,864	192,599	(192,599)	-	12.75%	259,917	(40,331)	219,586
United School	0.49393886%	6,583,505	3,357,843	8,889,637	6,583,505	4,665,520	428,125	(428,125)	-	12.75%	577,763	30,400	608,163
Upper Valley Spec Ed	0.38672835%	5,154,541	2,629,016	6,960,122	5,154,541	3,652,859	335,200	(335,200)	-	12.75%	452,359	39,300	491,659
Valley - Edinburg School	0.23915244%	3,187,563	1,625,781	4,304,133	3,187,563	2,258,924	207,287	(207,287)	-	12.75%	279,738	(6,755)	272,983
Valley City School	0.90128138%	12,012,804	6,126,995	16,220,761	12,012,804	8,513,091	781,192	(781,192)	-	12.75%	1,054,235	(173,487)	880,748
Velva School	0.39374499%	5,248,063	2,676,715	7,086,403	5,248,063	3,719,135	341,281	(341,281)	-	12.75%	460,566	(7,889)	452,677
Wahpeton School	0.97167313%	12,951,026	6,605,525	17,487,633	12,951,026	9,177,979	842,205	(842,205)	-	12.75%	1,136,572	(177,938)	958,634
Ward County	0.00432495%	57,645	29,401	77,838	57,645	40,851	3,749	(3,749)	-	12.75%	5,059	(270)	4,789
Warwick School	0.22722592%	3,028,600	1,544,703	4,089,486	3,028,600	2,146,272	196,950	(196,950)	-	12.75%	265,788	(62,243)	203,545
Washburn School	0.25862070%	3,447,048	1,758,128	4,654,512	3,447,048	2,442,813	224,161	(224,161)	-	12.75%	302,510	21,700	324,210
West Fargo School	8.90542987%	118,696,763	60,539,948	160,274,974	118,696,763	84,116,608	7,718,845	(7,718,845)	-	12.75%	10,416,739	2,410,637	12,827,376
West River Student Services	0.08951892%	1,193,160	608,558	1,611,112	1,193,160	845,555	77,591	(77,591)	-	12.75%	104,711	(19,134)	85,577
Westhope School	0.15624880%	2,082,575	1,062,194	2,812,079	2,082,575	1,475,855	135,430	(135,430)	-	12.75%	182,765	(9,711)	173,054
White Shield School	0.21221378%	2,828,509	1,442,649	3,819,306	2,828,509	2,004,474	183,938	(183,938)	-	12.75%	248,228	(40,030)	208,198
Williams Co School Dist #8	0.31574563%	4,208,442	2,146,468	5,682,614	4,208,442	2,982,388	273,675	(273,675)	-	12.75%	369,330	(46,041)	323,289
Williston School	2.83238560%	37,751,687	19,254,823	50,975,701	37,751,687	26,753,416	2,454,990	(2,454,990)	-	12.75%	3,313,060	729,355	4,042,415
Wilmac Special Education	0.55354108%	7,377,918	3,763,024	9,962,324	7,377,918	5,228,495	479,786	(479,786)	-	12.75%	647,481	215,294	862,775
Wilton School	0.19788155%	2,637,481	1,345,217	3,561,362	2,637,481	1,869,098	171,515	(171,515)	-	12.75%	231,463	3,655	235,118
Wing School	0.10461196%	1,394,329	711,162	1,882,748	1,394,329	988,117	90,673	(90,673)	-	12.75%	122,365	(6,338)	116,027
Wishek School	0.19129513%	2,549,693	1,300,442	3,442,823	2,549,693	1,806,886	165,806	(165,806)	-	12.75%	223,759	5,797	229,556
Wolford School	0.08241280%	1,098,446	560,250	1,483,220	1,098,446	778,434	71,432	(71,432)	-	12.75%	96,399	6,036	102,435
Wyndmere School	0.19784197%	2,636,953	1,344,948	3,560,650	2,636,953	1,868,725	171,481	(171,481)	-	12.75%	231,417	(64,786)	166,631
Yellowstone Elem. School	0.07285397%	971,040	495,268	1,311,185	971,040	688,145	63,147	(63,147)	-	12.75%	85,218	(11,807)	73,411
Zeeland School	0.06578945%	876,880	447,243	1,184,042	876,880	621,417	57,023	(57,023)	-	12.75%	76,954	(17,589)	59,365
Grand Totals:	**100%**	**1,332,858,315**	**679,809,385**	**1,799,744,383**	**1,332,858,315**	**944,554,161**	**86,675,715**	**(86,675,715)**	**-**	**12.75%**	**116,970,649**	**-**	**116,970,649**

Note: Columns may not foot due to rounding.

EXHIBIT E (continued)
Schedule of Pension Amounts by Employer as of June 30, 2018

	Deferred Outflows of Resources				Deferred Inflows of Resources					Deferred (Inflows)/Outflows Recognized In Future Pension Expense (Year Ended June 30):					
Employer Name	**Differences Between Expected and Actual Experience**	**Changes of Assumptions**	**Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions**	**Total Deferred Outflows of Resources**	**Differences Between Expected and Actual Experience**	**Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments**	**Changes of Assumptions**	**Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions**	**Total Deferred Inflows of Resources**	**2019**	**2020**	**2021**	**2022**	**2023**	**Thereafter**
	(14)	**(15)**	**(16)**	**(17)**	**(18)**	**(19)**	**(20)**	**(21)**	**(22)**	**(23)**	**(24)**	**(25)**	**(26)**	**(27)**	**(28)**
Alexander School	$ 6,532	$ 132,582	$ 260,898	$ 400,012	$ 65,456	$ 8,321	$ -	$ 24,057	$ 97,834	$ 139,503	$ 105,860	$ 46,834	$ 22,920	$ (10,259)	$ (2,680)
Anamoose School	4,111	83,446	58,830	146,387	41,198	5,237	-	18,433	64,868	60,383	39,208	2,056	(14,562)	(1,821)	(3,744)
Apple Creek Elem School	1,610	32,683	6,125	40,418	16,136	2,051	-	120,591	138,778	(5,074)	(13,367)	(27,918)	(19,603)	(17,950)	(14,447)
Ashley School	5,041	102,309	8,413	115,763	50,510	6,421	-	107,696	164,627	39,156	13,194	(32,350)	(40,929)	(20,032)	(7,902)
Bakker Elem School	218	4,428	7,145	11,791	2,186	278	-	2,818	5,282	3,090	1,966	(4)	22	951	484
Barnes County North	8,295	168,361	-	176,656	83,121	10,566	-	421,580	515,267	(4,492)	(47,215)	(122,162)	(96,518)	(39,482)	(28,742)
Beach School	11,055	224,382	-	235,437	110,778	14,082	-	353,044	477,904	47,210	(9,728)	(109,619)	(92,278)	(58,175)	(19,877)
Belcourt School	45,774	929,075	193,769	1,168,618	458,687	58,309	-	634,977	1,151,973	414,208	178,449	(235,154)	(229,821)	(92,827)	(18,209)
Belfield Public School	8,265	167,760	137,725	313,750	82,824	10,529	-	60,555	153,908	113,871	71,301	(3,380)	(15,282)	(11,144)	4,478
Beulah School	19,198	389,673	239,650	648,521	192,382	24,456	-	351,012	567,850	184,320	85,437	(88,036)	(98,784)	(21,025)	18,758
Billings Co. School Dist.	4,538	92,113	173,995	270,646	45,477	5,781	-	115,202	166,460	53,947	30,573	(10,433)	22,766	8,517	(1,184)
Bismarck Public Schools	387,304	7,861,160	1,896,025	10,144,489	3,881,076	493,365	-	1,780,404	6,154,845	4,684,323	2,689,497	(810,122)	(1,488,164)	(505,873)	(580,018)
Bismarck State College	-	-	-	-	-	-	-	26,788	26,788	(8,930)	(8,930)	(8,928)	-	-	-
Blessed John Paul II Catholic Sch Network	-	-	-	-	-	-	-	34,728	34,728	(8,788)	(8,788)	(8,785)	(8,367)	-	-
Bottineau School	20,137	408,732	191,983	620,852	201,792	25,652	-	518,512	745,956	154,762	51,043	(130,915)	(141,829)	(67,944)	9,780
Bowbells School	3,228	65,519	69,941	138,688	32,347	4,112	-	52,737	89,196	41,442	24,816	(4,350)	(3,965)	1,856	(10,308)
Bowman School	15,363	311,824	43,240	370,427	153,948	19,570	-	173,144	346,662	146,108	66,981	(71,839)	(84,828)	(22,912)	(9,745)
Burke Central School	5,544	112,524	328,565	446,633	55,553	7,062	-	184,006	246,621	82,795	54,241	4,147	35,267	3,445	20,115
Burleigh County Spec. Ed.	551	11,182	32,566	44,299	5,520	702	-	6,589	12,811	12,716	9,878	4,902	(17)	2,716	1,292
Carrington School	15,639	317,432	84,114	417,185	156,717	19,922	-	299,869	476,508	141,769	61,219	(80,095)	(108,573)	(65,121)	(8,522)
Cavalier School	11,851	240,545	42,895	295,291	118,758	15,097	-	190,359	324,214	116,828	55,788	(51,295)	(79,171)	(46,549)	(24,522)
Center Stanton School	8,364	169,757	111,556	289,677	83,809	10,654	-	56,699	151,162	106,401	63,324	(12,251)	(26,700)	811	6,928
Central Cass School	19,492	395,627	57,259	472,378	195,322	24,829	-	240,745	460,896	175,608	75,215	(100,909)	(98,625)	(18,338)	(21,469)
Central Elementary School	340	6,905	3,117	10,362	3,409	433	-	10,010	13,852	2,260	508	(2,565)	(2,847)	(988)	142
Central Valley School	6,900	140,057	25,970	172,927	69,146	8,790	-	127,129	205,065	51,167	15,627	(46,720)	(40,742)	(8,187)	(3,283)
Dakota Prairie School	10,781	218,833	221,296	450,910	108,038	13,734	-	65,067	186,839	154,403	98,873	1,455	(15,313)	3,534	21,119
Devils Lake School	54,378	1,103,723	-	1,158,101	544,911	69,269	-	1,545,725	2,159,905	289,308	9,230	(482,125)	(451,771)	(232,929)	(133,517)
Dickinson School	106,860	2,168,947	2,448,058	4,723,865	1,070,815	136,123	-	-	1,206,938	1,874,316	1,323,931	358,363	(134,883)	46,385	48,814
Divide School	13,575	275,527	160,464	449,566	136,028	17,292	-	64,277	217,597	168,969	99,053	(23,605)	(18,684)	8,890	(2,655)
Drake School	2,480	50,327	18,206	71,013	24,847	3,159	-	175,016	203,022	(9,654)	(22,425)	(44,828)	(35,968)	(19,434)	300
Drayton School	7,208	146,299	198,846	352,353	72,228	9,182	-	124,236	205,646	109,089	71,964	6,837	(27,894)	3,768	(17,056)
Dunseith School	17,496	355,126	529,386	902,008	175,327	22,288	-	-	197,615	321,595	231,479	73,384	46,503	33,623	(2,189)
E Central Ctr Exc Childn	4,236	85,976	4,078	94,290	42,447	5,396	-	97,413	145,256	28,570	6,753	(31,521)	(37,730)	(9,833)	(7,205)
Earl Elem. School	178	3,618	2,189	5,985	1,786	227	-	3,399	5,412	1,580	662	(951)	(767)	(119)	167
Edgeley School	6,544	132,819	-	139,363	65,573	8,336	-	186,730	260,639	43,582	9,878	(49,251)	(54,492)	(39,282)	(31,710)
Edmore School	3,950	80,182	73,145	157,277	39,586	5,032	-	76,588	121,206	45,990	25,643	(10,053)	(20,425)	(9,989)	4,905
Eight Mile School	9,039	183,459	423,858	616,356	90,574	11,514	-	88,922	191,010	182,216	135,662	53,987	14,141	8,861	30,480
Elgin-New Leipzig School	6,347	128,831	118,379	253,557	63,604	8,085	-	39,165	110,854	92,674	59,982	2,630	3,934	(7,276)	(9,242)
Ellendale School	8,586	174,266	-	182,852	86,035	10,937	-	448,546	545,518	4,067	(40,154)	(117,731)	(104,852)	(65,064)	(38,933)
Emerado Elementary School	3,329	67,569	45,515	116,413	33,359	4,241	-	27,311	64,911	40,218	23,072	(7,007)	(8,917)	3,067	1,069
Enderlin Area School District	10,767	218,530	41,584	270,881	107,889	13,715	-	190,154	311,758	104,608	49,154	(48,134)	(66,343)	(39,974)	(40,188)
Fairmount School	5,482	111,273	25,938	142,693	54,936	6,983	-	81,399	143,318	48,106	19,870	(29,664)	(32,631)	(4,581)	(1,726)
Fargo Public Schools	376,946	7,650,917	98,809	8,126,672	3,777,279	480,170	-	3,231,342	7,488,791	3,654,630	1,713,154	(1,692,871)	(1,701,940)	(935,667)	(399,427)
Fessenden-Bowdon School	5,724	116,174	48,336	170,234	57,356	7,291	-	22,018	86,665	75,365	45,885	(5,832)	(11,243)	(11,193)	(9,412)
Finley-Sharon School	5,441	110,435	20,672	136,548	54,522	6,931	-	260,094	321,547	2,018	(26,006)	(75,166)	(72,607)	(10,683)	(2,556)
Flasher School	6,240	126,649	76,842	209,731	62,527	7,948	-	93,404	163,879	59,859	27,721	(28,663)	(7,696)	3,022	(8,392)
Fordville Lankin School	3,083	62,583	-	65,666	30,897	3,928	-	68,953	103,778	21,974	6,093	(21,765)	(23,622)	(13,199)	(7,594)
Fort Ransom Elem School	859	17,433	4,429	22,721	8,607	1,094	-	25,717	35,418	5,960	1,536	(6,227)	(8,682)	(3,168)	(2,116)
Fort Totten School	7,382	149,832	-	157,214	73,972	9,403	-	495,595	578,970	(15,643)	(53,664)	(120,367)	(108,205)	(67,985)	(55,892)
Fort Yates School	5,839	118,508	192,108	316,455	58,508	7,438	-	403,462	469,408	42,427	12,355	(40,406)	(58,165)	(39,932)	(69,230)
Gackle-Streeter Pub Sch	4,270	86,677	17,153	108,100	42,793	5,440	-	44,738	92,971	41,916	19,921	(18,668)	(14,648)	(9,401)	(3,992)
Garrison School	12,547	254,672	67,511	334,730	125,732	15,983	-	133,001	274,716	140,361	75,736	(37,641)	(73,547)	(31,536)	(13,360)
Glen Ullin School	6,051	122,816	47,559	176,426	60,634	7,708	-	128,266	196,608	64,796	33,631	(21,044)	(43,827)	(31,639)	(22,100)
Glenburn School	9,290	188,559	247,533	445,382	93,092	11,834	-	344,558	449,484	105,899	58,051	(25,890)	(25,673)	(69,172)	(47,317)
Goodrich School	1,609	32,653	18,218	52,480	16,121	2,049	-	32,981	51,151	13,746	5,460	(9,078)	(7,642)	(2,423)	1,263
Grafton School	22,666	460,051	49,432	532,149	227,128	28,873	-	692,718	948,719	157,325	40,583	(164,220)	(206,659)	(146,443)	(97,156)
Grand Forks School	251,068	5,095,961	512,682	5,859,711	2,515,890	319,822	-	2,363,699	5,199,411	2,529,020	1,235,883	(1,032,732)	(973,509)	(604,975)	(493,388)
Great North West Cooperative	602	12,223	29,020	41,845	6,035	767	-	102,161	108,963	(3,022)	(6,124)	(11,568)	(18,873)	(19,975)	(7,554)
Grenora School	6,311	128,091	75,928	210,330	63,239	8,039	-	45,773	117,051	86,647	54,143	(2,883)	(29,700)	(10,826)	(4,102)
Griggs County Central Sch	8,839	179,414	10,601	198,854	88,577	11,260	-	306,088	405,925	26,864	(18,664)	(98,537)	(91,906)	(13,231)	(11,597)

EXHIBIT E (continued)
Schedule of Pension Amounts by Employer as of June 30, 2018

	Deferred Outflows of Resources				Deferred Inflows of Resources					Deferred (Inflows)/Outflows Recognized In Future Pension Expense (Year Ended June 30):					
Employer Name	Differences Between Expected and Actual Experience	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Outflows of Resources	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Inflows of Resources	2019	2020	2021	2022	2023	Thereafter
	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
Gst Educational Services	9,373	190,240	231,215	430,828	93,922	11,939	-	88,681	194,542	129,382	81,107	(3,586)	15,240	9,859	4,283
Halliday School	1,408	28,579	3,561	33,548	14,110	1,794	-	324,212	340,116	(41,163)	(48,415)	(61,138)	(63,940)	(55,289)	(36,622)
Hankinson School	8,104	164,483	61,619	234,206	81,206	10,323	-	289,483	381,012	23,582	(18,157)	(91,381)	(53,730)	(8,447)	1,328
Harvey School	12,258	248,796	74,495	335,549	122,831	15,614	-	256,580	395,025	107,868	44,734	(66,023)	(61,640)	(56,013)	(28,402)
Hatton Eielson Psd	5,979	121,353	-	127,332	59,912	7,616	-	138,290	205,818	41,891	11,097	(42,926)	(46,038)	(24,974)	(17,538)
Hazelton - Moffit School	4,285	86,981	70,205	161,471	42,943	5,459	-	173,076	221,478	27,237	5,165	(33,558)	(14,284)	(23,356)	(21,210)
Hazen School	15,948	323,698	127,401	467,047	159,810	20,315	-	154,296	334,421	182,698	100,557	(43,547)	(75,414)	(28,505)	(3,164)
Hebron School	6,373	129,357	18,390	154,120	63,864	8,118	-	96,627	168,609	55,294	22,468	(35,119)	(31,590)	(12,286)	(13,256)
Hettinger School	7,368	149,559	-	156,927	73,838	9,386	-	408,807	492,031	(15,799)	(53,751)	(120,330)	(86,467)	(41,005)	(17,751)
Hillsboro School	14,072	285,630	177,537	477,239	141,016	17,926	-	9,245	168,187	206,658	134,177	7,023	(32,322)	(2,176)	(4,308)
Hope School	3,728	75,666	151,714	231,108	37,356	4,749	-	113,218	155,323	47,220	28,019	(5,668)	(2,207)	(5,585)	14,004
Horse Creek Elem. School	205	4,169	50,298	54,672	2,058	262	-	56,973	59,293	1,841	783	(1,074)	(746)	2,273	(7,698)
James River Multidistrict Spec Ed Unit	7,881	159,961	171,658	339,500	78,973	10,039	-	-	89,012	131,928	91,337	20,125	(2,660)	9,595	163
Jamestown School	71,230	1,445,768	-	1,516,998	713,780	90,736	-	1,351,179	2,155,695	502,905	136,031	(507,595)	(454,412)	(187,189)	(128,436)
Kenmare School	9,618	195,227	28,087	232,932	96,384	12,252	-	181,496	290,132	67,209	17,669	(69,242)	(39,964)	(15,669)	(17,202)
Kensal School	1,551	31,481	25,476	58,508	15,542	1,976	-	229,895	247,413	(19,926)	(27,915)	(41,928)	(48,883)	(48,303)	(1,949)
Kidder County School District	11,492	233,264	105,250	350,006	115,163	14,640	-	407,050	536,853	53,217	(5,975)	(109,819)	(84,018)	(45,111)	4,860
Killdeer School	15,339	311,343	283,912	610,594	153,711	19,540	-	71,973	245,224	223,321	144,315	5,713	(36,025)	9,739	18,307
Kindred School	18,063	366,618	198,040	582,721	181,001	23,009	-	151,591	355,601	207,142	114,110	(49,100)	(56,289)	7,220	4,039
Kulm School	5,569	113,033	54,969	173,571	55,805	7,094	-	207,215	270,114	27,315	(1,368)	(51,690)	(47,849)	(25,966)	3,015
Lake Region Spec Ed	9,673	196,338	132,405	338,416	96,933	12,322	-	210,848	320,103	80,048	30,226	(57,179)	(48,645)	2,471	11,392
Lakota School	6,774	137,488	137,388	281,650	67,878	8,629	-	115,741	192,248	67,224	32,335	(28,871)	(2,494)	7,834	13,374
Lamoure School	8,095	164,297	34,527	206,919	81,114	10,311	-	213,521	304,946	64,894	23,203	(49,939)	(70,717)	(40,636)	(24,833)
Langdon Area School	12,479	253,282	665,911	931,672	125,046	15,896	-	436,567	577,509	167,182	102,910	(9,848)	(16,461)	111,607	(1,229)
Larimore School	11,878	241,079	149,157	402,114	119,022	15,130	-	242,007	376,159	94,836	33,660	(73,661)	(21,048)	(10,771)	2,939
Leeds School	5,664	114,967	16,331	136,962	56,759	7,215	-	150,012	213,986	39,689	10,516	(40,663)	(52,593)	(21,745)	(12,229)
Lewis And Clark School	13,885	281,824	72,669	368,378	139,137	17,687	-	330,613	487,437	123,702	52,187	(73,273)	(98,833)	(59,998)	(62,846)
Lidgerwood School	5,982	121,418	32,582	159,982	59,945	7,620	-	213,104	280,669	32,865	2,054	(51,997)	(38,828)	(35,139)	(29,641)
Linton School	8,784	178,300	12,663	199,747	88,027	11,190	-	207,674	306,891	53,982	8,737	(70,637)	(58,506)	(33,135)	(7,584)
Lisbon School	19,084	387,353	140,515	546,952	191,237	24,310	-	273,774	489,321	180,741	82,447	(89,991)	(62,900)	(43,076)	(9,591)
Litchville-Marion School	4,200	85,245	6,527	95,972	42,086	5,350	-	209,557	256,993	9,216	(12,416)	(50,364)	(40,879)	(34,201)	(32,377)
Little Heart Elem. School	707	14,351	39,612	54,670	7,085	901	-	6,783	14,769	14,358	10,717	4,327	2,764	5,859	1,877
Logan County	22	441	-	463	218	28	-	608	854	108	(4)	(202)	(181)	(81)	(31)
Lone Tree Elem. School	1,267	25,719	48,736	75,722	12,697	1,614	-	49,541	63,852	17,268	10,742	(705)	(6,530)	(9,675)	770
Lonetree Spec Ed Unit	1,141	23,154	90,416	114,711	11,431	1,453	-	6,870	19,754	27,439	21,564	11,254	10,499	11,337	12,863
Maddock School	4,858	98,596	-	103,454	48,677	6,188	-	211,444	266,309	15,944	(9,076)	(52,971)	(58,297)	(37,741)	(20,716)
Mandan Public Schools	107,573	2,183,421	899,823	3,190,817	1,077,961	137,031	-	104,101	1,319,093	1,525,172	971,113	(898)	(327,506)	(160,117)	(136,039)
Mandaree School	7,686	155,995	35,209	198,890	77,015	9,790	-	521,364	608,169	(19,123)	(58,708)	(128,155)	(95,303)	(88,898)	(19,092)
Manning Elem School	555	11,259	31,660	43,474	5,559	707	-	4,303	10,569	12,856	9,999	4,983	1,009	3,183	876
Manvel Elem. School	4,479	90,920	33,181	128,580	44,887	5,706	-	42,639	93,232	48,435	25,363	(15,113)	(9,887)	(6,581)	(6,870)
Maple Valley School	8,912	180,897	31,197	221,006	89,309	11,353	-	133,979	234,641	75,163	29,259	(51,274)	(45,119)	(9,606)	(12,057)
Mapleton Elem. School	4,260	86,462	141,186	231,908	42,686	5,426	-	40,379	88,491	68,418	46,477	7,987	(332)	18,191	2,674
Marmarth Elem. School	560	11,372	39,625	51,557	5,614	714	-	142,682	149,010	(12,640)	(15,526)	(20,590)	(13,642)	(22,441)	(12,613)
Max School	6,222	126,293	12,918	145,433	62,351	7,926	-	122,547	192,824	53,129	21,081	(35,139)	(37,026)	(27,943)	(21,491)
May-Port C-G School	14,683	298,033	40,751	353,467	147,140	18,704	-	185,860	351,704	152,946	77,318	(55,358)	(85,758)	(52,755)	(34,631)
Mcclusky School	2,985	60,584	44,262	107,831	29,911	3,802	-	399,084	432,797	(40,170)	(55,544)	(82,514)	(55,689)	(60,845)	(30,203)
Mckenzie County	235	4,760	2,595	7,590	2,350	299	-	16,740	19,389	(1,330)	(2,538)	(4,655)	(3,211)	154	(220)
Mckenzie County School	40,362	819,225	2,450,260	3,309,847	404,454	51,414	-	-	455,868	1,069,149	861,265	496,565	215,588	128,740	82,672
Medina School	5,676	115,201	99,267	220,144	56,875	7,230	-	107,165	171,270	65,215	35,982	(15,303)	(6,894)	(13,456)	(16,669)
Menoken Elem School	1,041	21,120	69,685	91,846	10,427	1,325	-	-	11,752	27,381	22,022	12,620	10,349	6,622	1,100
Midkota	5,648	114,628	62,920	183,196	56,592	7,194	-	131,145	194,931	40,409	11,321	(39,710)	(29,017)	2,069	3,192
Midway School	6,839	138,803	51,080	196,722	68,527	8,711	-	434,037	511,275	8,429	(26,793)	(88,584)	(77,042)	(76,280)	(54,283)
Milnor School	7,848	159,300	155,879	323,027	78,647	9,998	-	262,601	351,246	55,298	14,875	(56,040)	(57,961)	(1,710)	17,320
Minnewaukan School	9,309	188,951	244,077	442,337	93,286	11,859	-	321,103	426,248	76,496	28,548	(55,570)	(40,862)	(22,734)	30,213
Minot School	236,816	4,806,686	-	5,043,502	2,373,074	301,667	-	2,794,170	5,468,911	2,173,130	953,398	(1,186,438)	(1,260,315)	(646,188)	(458,998)
Minto School	6,820	138,418	130,853	276,091	68,337	8,687	-	89,592	166,616	89,204	54,080	(7,539)	(16,759)	6,461	(15,973)
Mohall Lansford Sherwood	11,207	227,479	-	238,686	112,307	14,277	-	527,260	653,844	10,063	(47,662)	(148,930)	(139,523)	(58,014)	(31,092)
Montpelier School	4,157	84,367	25,184	113,708	41,652	5,295	-	22,892	69,839	51,206	29,798	(7,759)	(13,155)	(10,750)	(5,471)
Morton County	54	1,099	1,299	2,452	543	69	-	34,634	35,246	(4,756)	(5,035)	(5,522)	(5,880)	(5,879)	(5,722)
Mott-Regent School	7,527	152,769	-	160,296	75,422	9,588	-	341,951	426,961	19,367	(19,399)	(87,408)	(85,827)	(63,656)	(29,742)

EXHIBIT E (continued)
Schedule of Pension Amounts by Employer as of June 30, 2018

	Deferred Outflows of Resources				Deferred Inflows of Resources					Deferred (Inflows)/Outflows Recognized In Future Pension Expense (Year Ended June 30):					
Employer Name	Differences Between Expected and Actual Experience	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Outflows of Resources	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Inflows of Resources	2019	2020	2021	2022	2023	Thereafter
	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
Mt Pleasant School	8,579	174,122	29,543	212,244	85,964	10,928	-	162,770	259,662	81,341	37,156	(40,360)	(58,353)	(42,639)	(24,563)
Munich School	5,425	110,108	162,074	277,607	54,361	6,910	-	7,573	68,844	99,265	71,324	22,305	7,329	2,362	6,179
N Central Area Career And Tech Center	-	-	-	-	-	-	-	249,455	249,455	(42,724)	(42,724)	(42,726)	(42,032)	(40,413)	(38,836)
Napoleon School	8,281	168,075	65,342	241,698	82,979	10,548	-	119,421	212,948	80,372	37,722	(37,102)	(42,450)	(11,549)	1,756
Naughton Rural School	504	10,233	26,463	37,200	5,052	642	-	1,018	6,712	10,635	8,038	3,481	3,244	3,706	1,383
Nd Center For Distance Education	7,291	147,996	406,038	561,325	73,066	9,288	-	190,677	273,031	168,367	130,812	64,929	(62,515)	(13,382)	83
Nd Dept Of Public Instruction	1,412	28,652	160,995	191,059	14,145	1,798	-	5,744	21,687	50,871	43,601	30,843	30,129	15,990	(2,063)
Nd School For Blind	3,824	77,626	64,727	146,177	38,324	4,872	-	90,271	133,467	36,998	17,300	(17,257)	(14,266)	(12,658)	2,594
Nd School For Deaf	5,058	102,671	58,881	166,610	50,689	6,444	-	58,938	116,071	59,844	33,790	(11,916)	(23,082)	(846)	(7,250)
Nd United	1,729	35,098	7,875	44,702	17,328	2,203	-	24,026	43,557	15,834	6,928	(8,697)	(9,296)	(3,025)	(598)
Nd Youth Correctional Cnt	6,499	131,911	78,531	216,941	65,125	8,279	-	174,070	247,474	50,942	17,468	(41,253)	(34,962)	(26,028)	3,300
Nedrose School	14,664	297,640	1,305,317	1,617,621	146,946	18,680	-	-	165,626	478,706	403,178	270,677	246,866	27,106	25,463
Nelson County	70	1,418	788	2,276	700	89	-	-	789	1,002	642	12	(145)	(21)	(4)
Nesson School	9,582	194,489	378,187	582,258	96,020	12,206	-	85,949	194,175	171,326	121,973	35,388	14,356	11,892	33,149
New England School	7,607	154,396	142,385	304,388	76,226	9,690	-	15,374	101,290	127,621	88,442	19,710	(8,077)	(13,641)	(10,957)
New Rockford Sheyenne School	9,215	187,035	112,088	308,338	92,340	11,738	-	280,662	384,740	65,786	18,325	(64,941)	(76,428)	(27,190)	8,046
New Salem-Almont	10,356	210,205	304,493	525,054	103,779	13,192	-	146,709	263,680	156,994	103,653	10,077	(29,484)	27,683	(7,549)
New Town School	26,427	536,385	841,399	1,404,211	264,815	33,663	-	147,385	445,863	451,837	315,725	76,936	(8,191)	80,934	41,107
Newburg United District	4,066	82,525	132,214	218,805	40,743	5,179	-	5,239	51,161	69,960	49,019	12,278	9,369	13,851	13,165
North Border School	14,518	294,680	205,973	515,171	145,484	18,494	-	628,899	792,877	75,337	559	(130,626)	(76,143)	(98,912)	(47,921)
North Sargent School	8,535	173,231	293,646	475,412	85,525	10,872	-	62,612	159,009	153,441	109,482	32,361	19,984	(7,504)	8,639
North Star	9,074	184,186	132,855	326,115	90,933	11,559	-	113,744	216,236	114,600	67,862	(14,132)	(31,707)	(26,670)	(73)
North Valley Area Career	3,003	60,945	66,782	130,730	30,089	3,825	-	160,219	194,133	5,257	(10,208)	(37,341)	(13,492)	2,231	(9,850)
Northern Cass School Dist	17,074	346,561	497,751	861,386	171,098	21,750	-	-	192,848	308,861	220,918	66,639	40,667	49,600	(18,146)
Northern Plains Spec Ed	1,686	34,222	100,219	136,127	16,896	2,148	-	10,250	29,294	43,949	35,265	20,031	1,528	7,426	(1,364)
Northwood School	8,737	177,345	146,446	332,528	87,556	11,130	-	16,400	115,086	134,493	89,491	10,543	(501)	(4,207)	(12,375)
Oakes School	11,241	228,167	120,831	360,239	112,646	14,320	-	193,054	320,020	105,668	47,769	(53,805)	(51,413)	(15,734)	7,733
Oberon Elem School	1,882	38,199	88,537	128,618	18,859	2,397	-	217,687	238,943	(16,099)	(25,793)	(42,800)	(34,507)	12,888	(4,015)
Oliver - Mercer Spec Ed	5,100	103,521	43,466	152,087	51,109	6,497	-	118,490	176,096	49,072	22,803	(23,286)	(39,457)	(29,500)	(3,639)
Page School	3,518	71,409	70,078	145,005	35,255	4,482	-	231,788	271,525	10,574	(7,546)	(39,338)	(39,967)	(18,861)	(31,383)
Park River Area School District	11,124	225,794	44,189	281,107	111,475	14,171	-	293,037	418,683	69,804	12,507	(88,009)	(71,628)	(28,067)	(32,183)
Parshall School	9,943	201,821	385,946	597,710	99,640	12,666	-	314,468	426,774	105,415	54,201	(35,644)	(17,972)	11,581	53,355
Peace Garden Spec Ed	3,177	64,476	91,098	158,751	31,832	4,046	-	-	35,878	58,717	42,356	13,655	(644)	5,018	3,771
Pembina Spec Ed Coop	661	13,407	21,077	35,145	6,619	841	-	63,090	70,550	(9,590)	(12,992)	(18,958)	867	2,511	2,756
Pingree - Buchanan School	4,464	90,605	10,415	105,484	44,732	5,686	-	64,234	114,652	39,868	16,877	(23,460)	(19,338)	(13,111)	(10,004)
Pleasant Valley Elem	-	-	-	-	-	-	-	14,258	14,258	(4,753)	(4,753)	(4,752)	-	-	-
Powers Lake School	6,218	126,210	140,147	272,575	62,310	7,921	-	69,875	140,106	90,580	58,553	2,364	(11,284)	(12,178)	4,433
Richardton-Taylor	9,694	196,751	90,243	296,688	97,136	12,348	-	77,262	186,746	118,246	68,319	(19,271)	(46,104)	(7,613)	(3,635)
Richland School	8,058	163,559	87,963	259,580	80,750	10,265	-	347,482	438,497	33,468	(8,036)	(80,846)	(82,708)	(13,312)	(27,483)
Robinson School	-	-	-	-	-	-	-	70,776	70,776	(20,228)	(20,228)	(20,228)	(10,092)	-	-
Rolette County	-	-	-	-	-	-	-	3,413	3,413	(1,137)	(1,137)	(1,139)	-	-	-
Rolette School	6,725	136,503	129,220	272,448	67,392	8,567	-	105,927	181,886	93,404	58,765	(2,002)	(27,022)	(9,992)	(22,591)
Roosevelt School	2,080	42,225	74,964	119,269	20,847	2,650	-	130,724	154,221	10,249	(466)	(19,264)	(14,811)	(16,790)	6,131
Roughrider Area Career And Tech Center	738	14,975	50,669	66,382	7,393	940	-	84,265	92,598	(2,738)	(6,538)	(13,206)	(11,557)	8,822	(999)
Roughrider Service Program	1,379	27,980	183,342	212,701	13,814	1,756	-	89,449	105,019	53,487	46,387	33,929	5,728	(17,415)	(14,433)
Rugby School	17,782	360,917	-	378,699	178,186	22,651	-	69,596	270,433	194,650	103,065	(57,610)	(76,843)	(33,313)	(21,684)
Rural Cass Spec Ed	6,443	130,784	359,135	496,362	64,568	8,208	-	217,356	290,132	88,860	55,672	(2,551)	(706)	12,209	52,746
Sargent Central School	8,606	174,685	177,031	360,322	86,242	10,963	-	38,904	136,109	120,080	75,752	(2,012)	923	18,078	11,392
Sawyer School	2,752	55,856	29,158	87,766	27,576	3,506	-	635,268	666,350	(75,990)	(90,164)	(115,028)	(127,898)	(108,869)	(60,634)
Scranton School	6,157	124,969	50,601	181,727	61,698	7,843	-	56,991	126,532	69,251	37,539	(18,092)	(29,588)	(3,331)	(583)
Se Region Career And Tech	8,042	163,222	41,067	212,331	80,583	10,244	-	1,551	92,378	104,421	63,002	(9,663)	(20,544)	(8,135)	(9,129)
Selfridge School	5,011	101,709	54,907	161,627	50,214	6,383	-	13,800	70,397	65,027	39,218	(6,058)	(7,198)	(520)	761
Sheyenne Valley Area Voc	4,129	83,814	80,724	168,667	41,379	5,260	-	75,713	122,352	45,861	24,593	(12,722)	(12,001)	(6,521)	7,104
Sheyenne Valley Spec Ed	8,110	164,617	116,553	289,280	81,272	10,331	-	327,952	419,555	44,246	2,473	(70,812)	(90,244)	(21,343)	5,406
Slope County	138	2,805	838	3,781	1,385	176	-	1,215	2,776	1,461	750	(500)	(534)	(157)	(14)
Solen - Cannonball School	8,504	172,615	96,432	277,551	85,221	10,833	-	379,465	475,519	19,615	(24,188)	(101,034)	(40,589)	(18,049)	(33,722)
Souris Valley Spec Ed	6,141	124,642	204,357	335,140	61,536	7,822	-	835,413	904,771	(68,596)	(100,224)	(155,712)	(159,579)	(112,802)	27,282
South Cent. Prairie Sp Ed	309	6,270	-	6,579	3,096	394	-	77,478	80,968	(9,691)	(11,282)	(14,070)	(13,827)	(12,939)	(12,579)
South East Education Cooperative	2,821	57,248	898,787	958,856	28,264	3,593	-	272,380	304,237	167,715	153,188	127,702	124,472	130,049	(48,507)
South Heart School	9,434	191,487	380,886	581,807	94,538	12,018	-	-	106,556	194,766	146,175	60,931	25,911	28,063	19,406

EXHIBIT E (continued)
Schedule of Pension Amounts by Employer as of June 30, 2018

	Deferred Outflows of Resources				Deferred Inflows of Resources					Deferred (Inflows)/Outflows Recognized In Future Pension Expense (Year Ended June 30):					
Employer Name	**Differences Between Expected and Actual Experience**	**Changes of Assumptions**	**Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions**	**Total Deferred Outflows of Resources**	**Differences Between Expected and Actual Experience**	**Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments**	**Changes of Assumptions**	**Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions**	**Total Deferred Inflows of Resources**	**2019**	**2020**	**2021**	**2022**	**2023**	**Thereafter**
	(14)	**(15)**	**(16)**	**(17)**	**(18)**	**(19)**	**(20)**	**(21)**	**(22)**	**(23)**	**(24)**	**(25)**	**(26)**	**(27)**	**(28)**
South Prairie Elem School	12,921	262,249	1,106,918	1,382,088	129,473	16,459	-	-	145,932	409,920	343,372	226,626	186,173	66,987	3,077
South Valley Spec Ed	2,581	52,380	171,289	226,250	25,860	3,287	-	389,726	418,873	(30,050)	(43,342)	(66,658)	(78,610)	4,834	21,203
Southwest Special Education Unit	358	7,273	1,376	9,007	3,591	456	-	3,329	7,376	3,432	1,587	(1,649)	(1,076)	(271)	(391)
St. John'S School	14,066	285,503	66,206	365,775	140,954	17,918	-	75,834	234,706	162,539	90,090	(37,010)	(58,977)	(12,190)	(13,382)
St. Thomas School	3,182	64,595	358	68,135	31,891	4,054	-	183,514	219,459	472	(15,920)	(44,675)	(48,438)	(25,277)	(17,484)
Stanley School	19,784	401,551	532,882	954,217	198,247	25,201	-	39,892	263,340	341,850	239,954	61,193	4,611	53,720	(10,452)
Starkweather School	2,632	53,431	-	56,063	26,379	3,353	-	189,691	219,423	(8,537)	(22,095)	(45,881)	(44,090)	(31,197)	(11,560)
Sterling School	1,558	31,632	65,091	98,281	15,617	1,985	-	-	17,602	31,897	23,870	9,790	3,551	6,036	5,536
Strasburg School District	5,100	103,523	176,157	284,780	51,110	6,497	-	85,514	143,121	64,022	37,752	(8,336)	14,329	21,214	12,679
Surrey School	13,420	272,382	138,967	424,769	134,476	17,095	-	87,682	239,253	164,862	95,743	(25,517)	(44,883)	(11,042)	6,353
Sweet Briar Elem School	595	12,086	37,022	49,703	5,967	759	-	-	6,726	14,152	11,085	5,703	4,848	5,402	1,788
Tgu School District	13,787	279,844	-	293,631	138,160	17,563	-	418,850	574,573	77,347	6,334	(118,243)	(120,669)	(83,134)	(42,577)
Thompson School	12,600	255,750	332,029	600,379	126,264	16,051	-	51,279	193,594	197,244	132,346	18,491	21,149	29,227	8,328
Tioga School	16,831	341,622	394,515	752,968	168,660	21,440	-	52,916	243,016	300,534	213,845	61,761	(33,952)	(24,984)	(7,253)
Turtle Lake-Mercer School	7,017	142,421	167,105	316,543	70,314	8,938	-	173,182	252,434	61,919	25,778	(37,622)	(13,109)	19,655	7,488
Twin Buttes Elem. School	2,400	48,711	45,561	96,672	24,049	3,057	-	89,365	116,471	12,881	520	(21,166)	(18,741)	4,466	2,240
Underwood School	8,038	163,155	-	171,193	80,550	10,240	-	189,140	279,930	54,727	13,325	(59,306)	(62,883)	(36,357)	(18,243)
United School	17,868	362,674	413,984	794,526	179,053	22,761	-	180,219	382,033	241,702	149,671	(11,783)	12,541	47,717	(27,356)
Upper Valley Spec Ed	13,990	283,955	206,859	504,804	140,189	17,821	-	36,805	194,815	204,740	132,684	6,276	(31,720)	5,156	(7,146)
Valley - Edinburg School	8,651	175,597	181,585	365,833	86,693	11,020	-	262,643	360,356	95,552	50,993	(27,176)	(26,065)	(54,346)	(33,481)
Valley City School	32,604	661,764	94,846	789,214	326,715	41,532	-	716,246	1,084,493	212,073	44,145	(250,456)	(139,887)	(99,094)	(62,061)
Velva School	14,244	289,107	113,691	417,042	142,733	18,144	-	91,884	252,761	160,551	87,189	(41,513)	(33,129)	(502)	(8,317)
Wahpeton School	35,150	713,450	-	748,600	352,232	44,776	-	845,078	1,242,086	237,735	56,692	(260,922)	(284,309)	(159,716)	(82,966)
Ward County	156	3,176	692	4,024	1,568	199	-	1,656	3,423	1,580	774	(640)	(779)	(279)	(56)
Warwick School	8,220	166,840	134,399	309,459	82,370	10,471	-	502,770	595,611	34,962	(7,375)	(81,647)	(135,862)	(78,825)	(17,404)
Washburn School	9,356	189,892	223,594	422,842	93,750	11,918	-	100,695	206,363	132,336	84,149	(388)	(8,011)	(6,930)	15,323
West Fargo School	322,154	6,538,798	10,638,135	17,499,087	3,228,223	410,374	-	-	3,638,597	6,220,298	4,561,030	1,650,099	736,059	677,264	15,739
West River Student Services	3,238	65,729	51,100	120,067	32,451	4,125	-	204,432	241,008	19,161	2,482	(26,777)	(47,519)	(35,446)	(32,841)
Westhope School	5,652	114,725	53,828	174,205	56,640	7,200	-	139,682	203,522	57,131	28,018	(23,053)	(47,468)	(23,292)	(20,653)
White Shield School	7,677	155,818	61,169	224,664	76,928	9,779	-	202,325	289,032	50,753	11,213	(58,154)	(51,802)	(18,102)	1,724
Williams Co School Dist #8	11,422	231,836	97,095	340,353	114,458	14,550	-	233,320	362,328	89,032	30,202	(73,003)	(59,930)	(11,854)	3,578
Williston School	102,461	2,079,675	2,575,349	4,757,485	1,026,741	130,520	-	93,667	1,250,928	1,941,023	1,413,291	487,465	(93,767)	(151,840)	(89,616)
Wilmac Special Education	20,024	406,437	1,057,473	1,483,934	200,659	25,508	-	241,072	467,239	452,094	348,958	168,018	69,682	40,215	(62,270)
Wilton School	7,158	145,294	63,633	216,085	71,732	9,119	-	61,085	141,936	88,307	51,437	(13,242)	(22,770)	(11,503)	(18,078)
Wing School	3,784	76,811	54,391	134,986	37,922	4,821	-	75,777	118,520	38,413	18,922	(15,270)	(15,449)	(440)	(9,709)
Wishek School	6,920	140,458	62,689	210,067	69,345	8,815	-	34,793	112,953	87,631	51,989	(10,539)	(21,895)	(1,267)	(8,805)
Wolford School	2,981	60,511	49,166	112,658	29,875	3,798	-	22,097	55,770	41,291	25,936	(1,004)	(11,081)	340	1,407
Wyndmere School	7,157	145,265	-	152,422	71,718	9,117	-	302,553	383,388	19,849	(17,013)	(81,684)	(72,063)	(44,072)	(35,982)
Yellowstone Elem. School	2,635	53,493	40,681	96,809	26,410	3,357	-	117,082	146,849	19,358	5,784	(18,029)	(29,410)	(12,874)	(14,869)
Zeeland School	2,380	48,306	84,519	135,205	23,849	3,032	-	121,190	148,071	10,555	(1,703)	(23,210)	(18,830)	10,847	9,474
Grand Totals:	**3,617,497**	**73,424,847**	**47,155,763**	**124,198,107**	**36,250,051**	**4,608,132**	**-**	**47,155,763**	**88,013,946**	**42,779,078**	**24,146,992**	**(8,540,179)**	**(12,683,573)**	**(5,526,862)**	**(3,991,295)**

Note: Columns may not foot due to rounding.

North Dakota Teachers' Fund For Retirement

MEMORANDUM

TO: **TFFR Board**

FROM: **Fay Kopp**

DATE: **January 17, 2019**

SUBJ: **2018 Valuation Update – Active Member Population Growth**

Kim Nicholl and Matt Strom, Segal Consultants, will review their November 30, 2018 letter (attached). The Segal analysis shows the impact of active member population growth on TFFR's funded ratio, as requested by the Legislative Employee Benefits Programs Committee at their October meeting.

Board Information. No board action is requested.

Segal Consulting

101 North Wacker Drive Suite 500 Chicago, IL 60606-1724
T 312.984.8500 www.segalco.com

November 30, 2018

Via E-Mail

Ms. Fay Kopp
NDRIO Deputy Executive Director / NDTFFR Chief Retirement Officer
ND Retirement & Investment Office | ND Teachers' Fund for Retirement
3442 East Century Avenue | P.O. Box 7100
Bismarck, ND 58507-7100

Re: **Active Member Population Growth – Impact on Funded Ratio**

Dear Fay:

As requested, we have performed the analysis of the projected funded ratio and projected retired member headcounts of the Teachers' Fund for Retirement. The analysis is based on an assumption for growth in active member population of 1% for fiscal years 2019 through 2028 and 0% thereafter, provided by the North Dakota Teachers' Fund for Retirement and North Dakota Department of Public Instruction.

Using the assumption of 1% growth for the next 10 years, the number of active members is expected to increase from 10,881 as of July 1, 2018, to about 12,000 by 2028. Key results of the projections reflecting the assumed active member population growth are:

- The number of retired members is not projected to exceed the number of active members within the next 30 years. See Exhibit A for more details.

- The funded ratio is projected to reach 100% in 2041 (two years earlier than the scenario assuming level active membership). See Exhibit B for more details.

Actuarial Assumptions and Methods for Projections

To develop the 30-year projections, the following assumptions, methods and plan provisions were used:

- Market return of 7.75% for all future years
- Active member population increases by 1% per year for fiscal years 2019 through 2028
    - Demographic projection based on open group projection of membership where new active members replace existing active member that are assumed to retire or otherwise decrement from active service
    - New hires are assumed to have similar characteristics as those active members hired within the past seven years
- Current contribution rates:
    - Member rate is 11.75%
    - Employer rate is 12.75%
    - Member and employer contribution rates “sunset” back to 7.75% once the funded ratio reaches 100% (based on actuarial assets)
- All other assumptions, methods and plan provisions are the same as in the July 1, 2018 valuation

Caveats

Projections, by their nature, are not a guarantee of future results. The projections modeled above are intended to serve as estimate of future financial outcomes that are based on the information available to us at the time the modeling undertaken and completed, and the agreed-upon assumptions and methodologies described herein. Emerging results may differ significantly if the actual experience proves to be different from these assumptions or if alternate methodologies are used.

Please contact us if you have any questions or comments.

Sincerely yours,

Kim Nicholl

Kim M. Nicholl, FSA, EA, FCA
Senior Vice President & Actuary

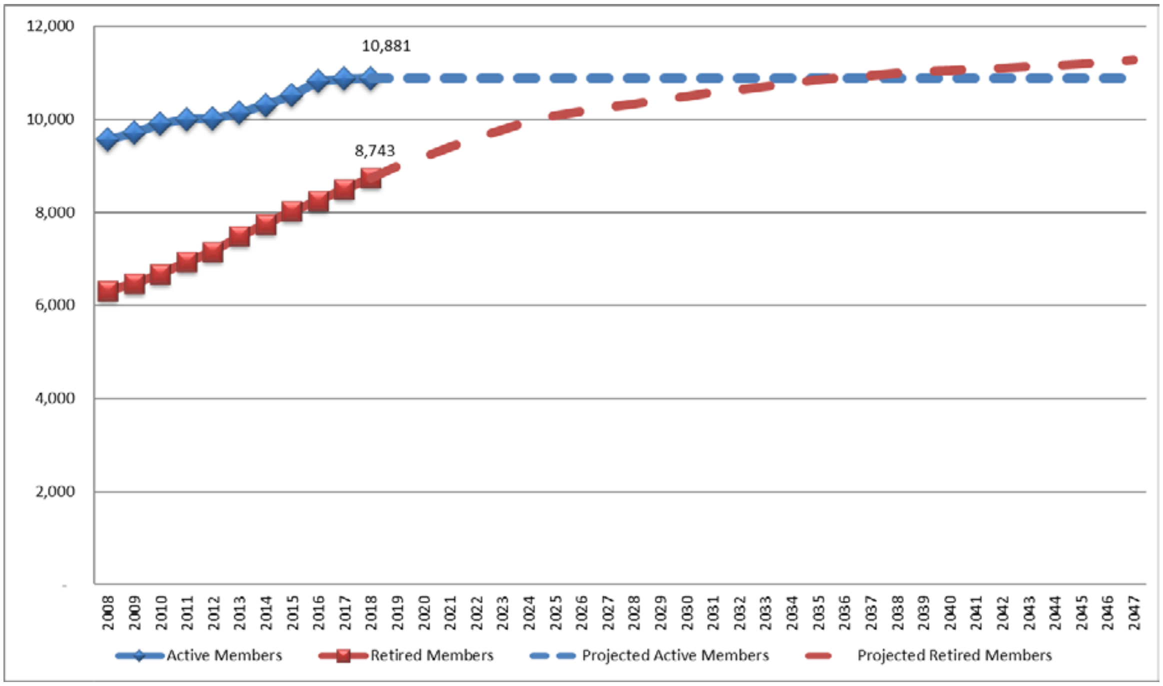
cc: Matthew Strom

Exhibit A

North Dakota Teachers' Fund of Retirement

Active and Retired Membership

Baseline – Level Active Population as Presented at the October 25, 2018 Meeting



Projected 1% Increase in Active Membership per Year for 10 Years

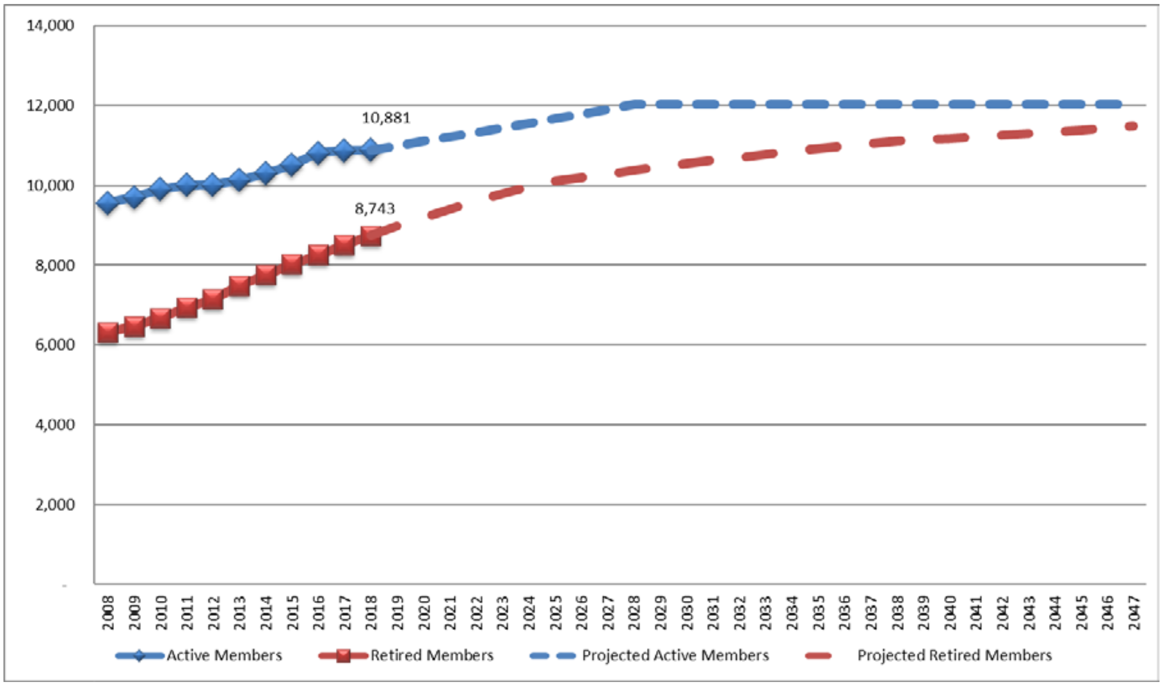
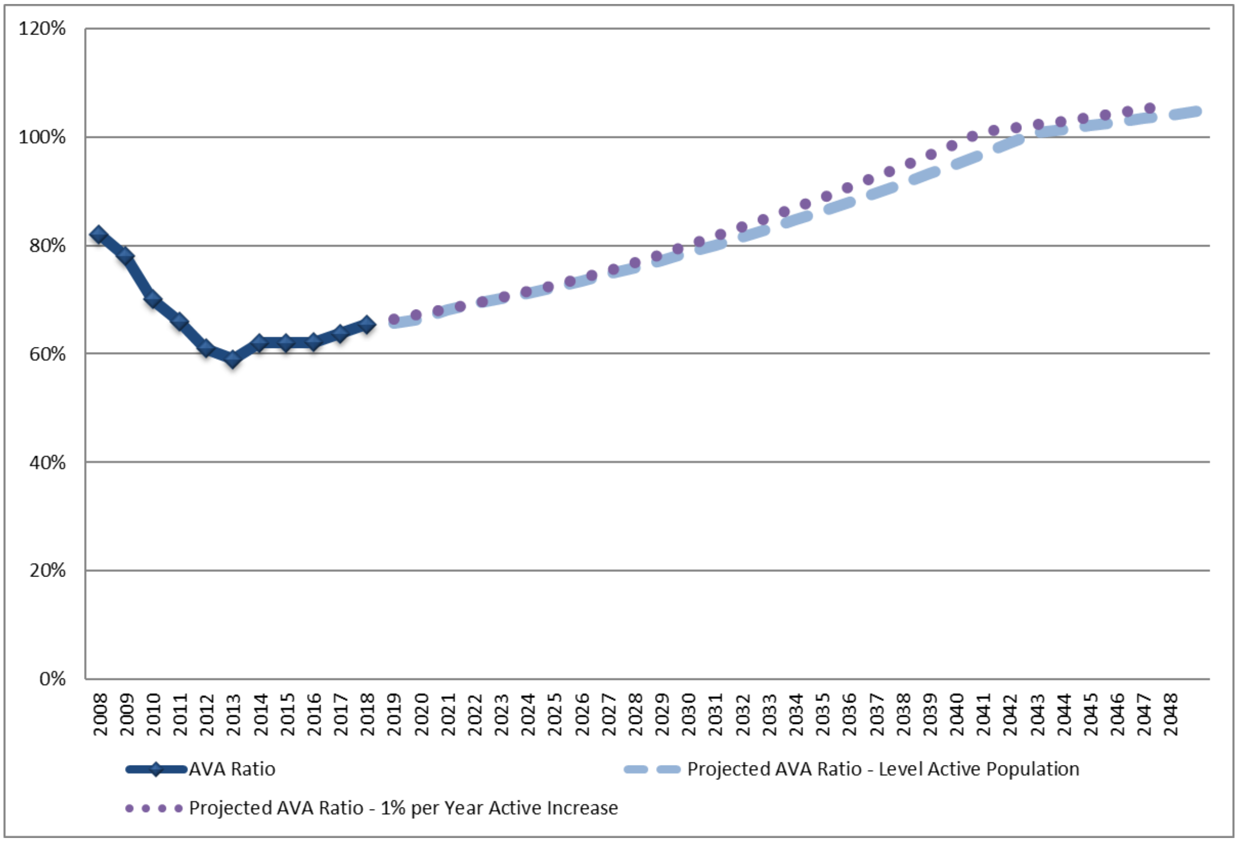


Exhibit B

North Dakota Teachers' Fund of Retirement

Funded Ratio



North Dakota
Teachers' Fund For Retirement

MEMORANDUM

TO: **TFFR Board**

FROM: **Fay Kopp**

DATE: **January 17, 2019**

SUBJ: **Development of Stochastic Projections and Plan Management Policy**

Kim Nicholl and Matt Strom, Segal Consultants, will present a proposal to provide stochastic projections and develop a TFFR plan management policy.

This topic was initially presented by Segal as Board Education at the October 25, 2018 meeting at which time the Board requested a proposal including project plan, timeline, and cost for Board consideration.

Segal will summarize their proposal in a presentation to the Board at the January meeting. The Segal presentation and proposal is currently being finalized and will be added to the website as soon as it is completed (prior to the meeting).

Board Information.

Board action will be requested when actuarial proposals are discussed by Board in Agenda #6.

NORTH DAKOTA
RETIREMENT AND
INVESTMENT OFFICE
Teachers' Fund for Retirement
State Investment Board

Segal Consulting

North Dakota Teachers' Fund for Retirement

Presentation from the Actuaries

January 24, 2019

Presented By:

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

Matt Strom, FSA, MAAA, EA
Vice President and Actuary

This document has been prepared by Segal Consulting for the benefit of the Board of Trustees of the North Dakota Teachers' Fund for Retirement and is not complete without the presentation provided at the January 24, 2019 meeting of the Board of Trustees.

Discussion Topics

- GASB 68 Report
- Member Population Growth Cost Analysis
- Background on Open Group Modeling and Stochastic Projections
- Proposal for Plan Management Policy

GASB 68 Report

- The GASB 68 report is used by TFFR participating employers to fulfill certain accounting and disclosure requirements for their financials
- Primary items of interest are employers' share of TFFR collective Net Pension Liability and collective Pension Expense
- Net Pension Liability at 6/30/2018 decreased from prior year as a result of strong investment performance
  - $1.33b current year (compared to $1.37b prior year)
  - Assets valued at market without smoothing
- Pension Expense for year ending 6/30/2018 decreased from prior fiscal year
  - $117m for fiscal 2017 (compared to $131m for fiscal 2017)
- Proportionate share of Net Pension Liability, Pension Expense, and other related items allocated over 214 participating TFFR employers

Active Member Population Growth Analysis

- Impact of 1% growth in active population for fiscal years 2019 through 2028 and 0% growth thereafter
  - Projected funded ratio
  - Projected active and pensioner headcounts
- Active member count would increase from 10,881 as of 7/1/2018 to about 12,000 by 2028
- Pensioner count would increase from 8,743 as of 7/1/2018 to about 11,500 in 30 years
  - Compared to about 11,300 pensioners without any increase in actives
- Funded ratio is projected to reach 100% in 2041, assuming all assumptions are realized
  - Two years earlier than without any increase in actives

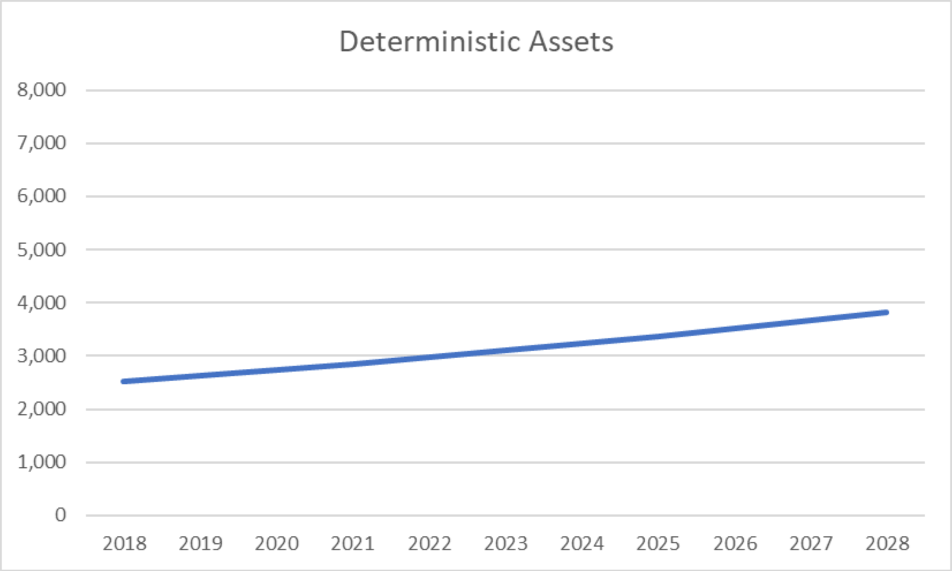
Why Projections Are Important

> If you don’t know where you are going, any road will get you there.
>
> *—Lewis Carroll, Alice in Wonderland*

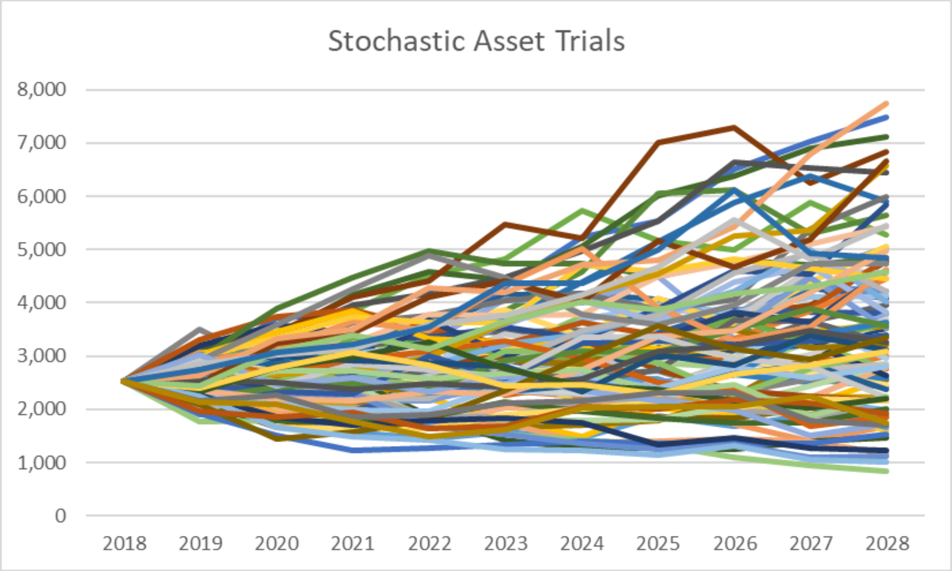
Overview of Open Group Projection

- “Closed group” projections can be created from the actuarial valuation
  - Based on census data as of the valuation date
  - Future liabilities calculated recursively by “roll forward”:
    - Accrued Liability_2 = (Accrued Liability_1 + Normal Cost_1), with interest – Benefit Payments_1
- Drawbacks to roll forward approach
  - Does not accurately reflect liability progression when multiple tiers of active benefits exist
- Open group projection generates projected population for each future valuation date based on assumptions related to retirement, termination, turnover, salary increase, mortality, etc.
  - New entrants generated to maintain level active population
    - Based on recent demographics of new hires, subject to input from Staff and Board
  - Projected future normal cost reflect realistic “tier” composition

Explanation of Deterministic vs. Stochastic



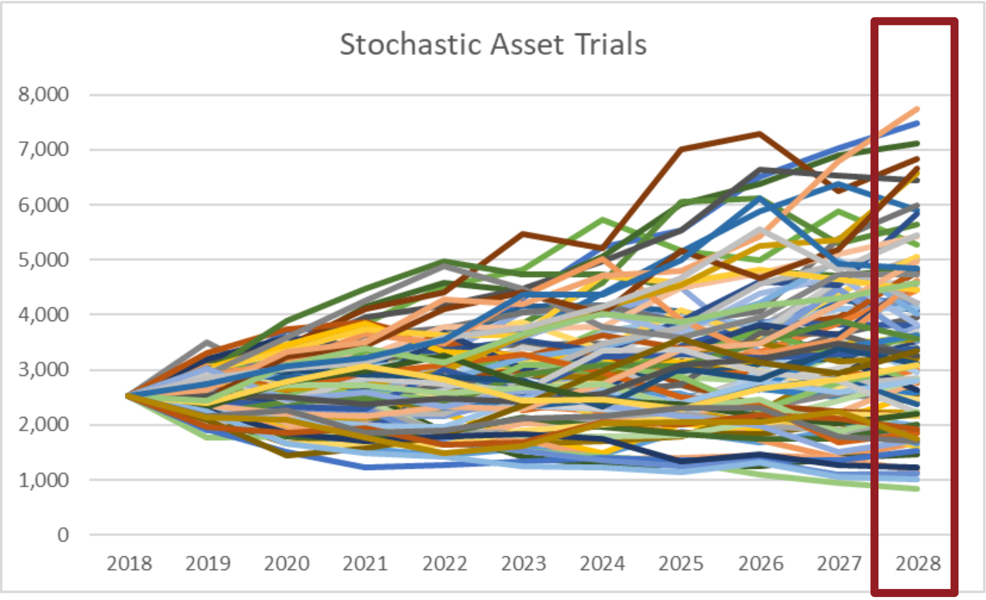
- Deterministic projections convey ***expectation*** and directional trend, but give no sense of the possible volatility of results
- They are ***simpler and easier*** to understand but are difficult to use in assessing alternative and do not measure risk/reward trade-offs

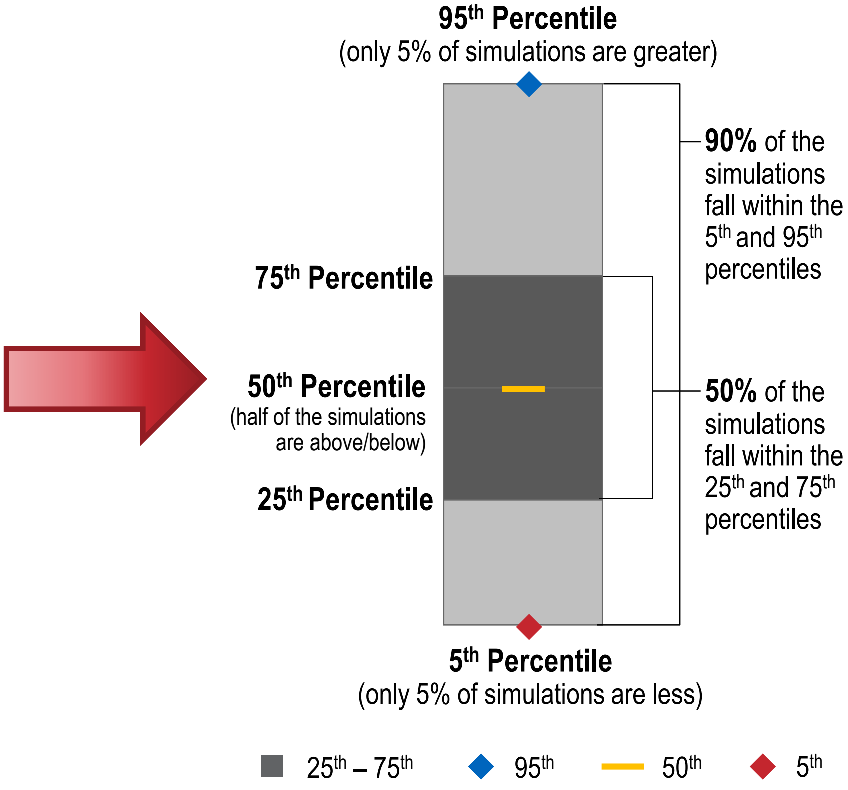


- Stochastic projections produce a distribution of results so expectation and ***volatility*** around expected results can be calculated
- They are ***complex*** and require many assumptions but are superior in terms of aiding decisions that require the weighing of ***risk/reward*** trade-offs
- Typically 2,500 to 5,000 trials are run

Explanation of Deterministic vs. Stochastic

The data is grouped into percentiles and summarized as a range





95th Percentile
(only 5% of simulations are greater)

90% of the simulations fall within the 5th and 95th percentiles

75th Percentile

50th Percentile
(half of the simulations are above/below)

50% of the simulations fall within the 25th and 75th percentiles

25th Percentile

5th Percentile
(only 5% of simulations are less)

■ 25th – 75th ◆ 95th — 50th ◆ 5th

- The median is represented by the yellow line at the center of the distribution
- The dark gray shaded rectangle represents 50% of all outcomes around the median
- The large, light gray rectangle (inclusive of the dark gray area) represents 90% of all outcomes around the median
- Other percentile results are calculated as well

Stochastic Modeling

➢ Given a certain set of assumptions:

- What is the range of possible results?
- What is the probability of achieving certain metrics (e.g., funded percentage, stable ADC, etc.)?
- What are the chances of a declining funded percentage over time?
- Alternatively, what is the likelihood of long-term “success?”

➢ What are metrics for success?

- Probability of reaching a 100% funding level?
- Probability of being able to improve benefits or reduce contributions?
- Probability of avoiding insolvency?
- Other?

➢ More than one metric can be modeled

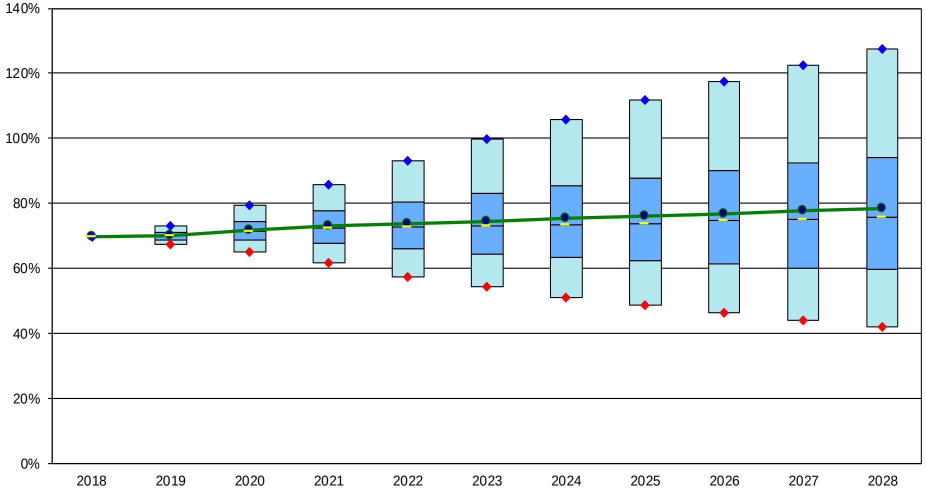
- Stochastically model investment returns and overlay the results on various payroll growth or decline assumptions

Stochastic Projections

- Below are two graphs that show the funded ratio and employer contribution for a sample pension plan

FUNDED RATIO

Projected Funded Ratio as of January 1

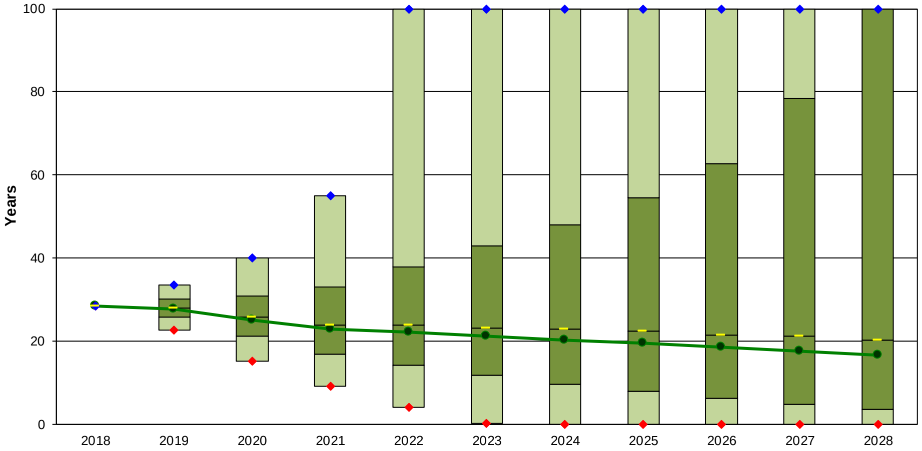


	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
◆ 95th	70%	73%	79%	86%	93%	100%	106%	112%	117%	123%	128%
▬ 75th	70%	71%	74%	78%	80%	83%	85%	88%	90%	92%	94%
▬ 50th	70%	70%	71%	73%	73%	73%	73%	74%	75%	75%	76%
▬ 25th	70%	69%	69%	68%	66%	64%	63%	62%	61%	60%	59%
◆ 5th	70%	67%	65%	62%	57%	54%	51%	49%	46%	44%	42%
●	70%	70%	72%	73%	74%	74%	75%	76%	77%	78%	78%

● Baseline deterministic projection with proposed assumption changes using current 8.00% investment return assumption

FUNDING PERIOD

Projected Funding Period for Plan Years Beginning January 1



	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
◆ 95th	28.3	33.5	40.1	54.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
▬ 75th	28.3	30.2	30.8	33.0	37.9	42.9	48.0	54.6	62.7	78.4	100.0
▬ 50th	28.3	28.0	25.6	23.8	23.7	23.1	22.9	22.4	21.4	21.1	20.2
▬ 25th	28.3	25.8	21.0	16.9	14.0	11.6	9.6	7.9	6.2	4.6	3.4
◆ 5th	28.3	22.7	15.2	9.2	4.1	0.1	0.0	0.0	0.0	0.0	0.0
●	28.3	27.7	25.0	22.9	22.0	21.2	20.3	19.4	18.5	17.6	16.6

● Baseline deterministic projection with proposed assumption changes using current 8.00% investment return assumption

- For example, the sample tables above illustrate that by 2028, there is a 25% probability of being less than 59% funded and 50% probability of the funding period being more than 20.2 years

Stochastic modeling can be used to establish and assess parameters for monitoring the health and direction of a System

Plan Funding Policy vs. Plan Management Policy

A funding policy sets actuarially sound contribution rates

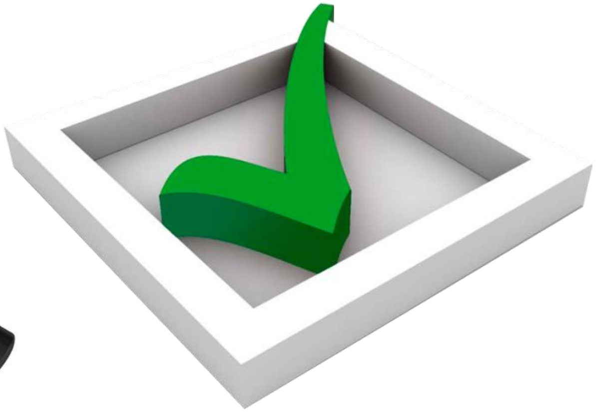
- A funding policy serves as a benchmark, which can be compared to the fixed employer contribution rates
- Actuarially determined contribution is equal to Normal Cost plus 25 year amortization of Unfunded Accrued Liability (as of 7/1/2018)
  - Amortization targets 100% funding in 25 years
  - TFFR's amortization method is 30 year closed period that began on July 1, 2013

TFFR should consider developing a plan management policy

- Identify and establish objective criteria to evaluate health of TFFR
- Illustrates market volatility and contribution inadequacy risks through stochastic modeling
- Allows Board to evaluate future funded ratio based on probabilities
- Serves as advance warning tool

A plan management policy is a more robust way to evaluate the ongoing health and sustainability of TFFR

Steps to Develop Plan Management Policy



Establish financial metrics

- Funded percentage
- Funding period

Determine how the plan management policy will be monitored

- Projections and stochastic analysis prepared periodically with the annual valuation

Develop scoring system that will identify triggers for action

- Design so each metric contributes to overall score with appropriate weighting

Development of the plan management policy will require input from TFFR staff, the Board, actuary and possibly other stakeholders

Sample Scoring System

Criteria 1

Based on current year funded ratio

- **Ideal condition:** 85% or higher: **+0**
- **Intermediate condition:** 60% to 85%: **+1**
- **Problematic condition:** Less than 60%: **+2**

Criteria 2

Based on projected funded ratio in 10 years

- **Ideal condition:** >90% with 75% probability: **+0**
- **Problematic condition:** <60% with 50% probability: **+2**
- **Intermediate condition:** between ideal and problematic: **+1**

Criteria 3

Based on projected funding period in 10 years

- **Ideal condition:** At or below “policy period* minus 10” with 50% probability: **+0**
- **Problematic condition:** Above 30 years with 50% probability: **+2**
- **Intermediate condition:** between ideal and problematic: **+1**

Criteria 4

Based on current economic cycle

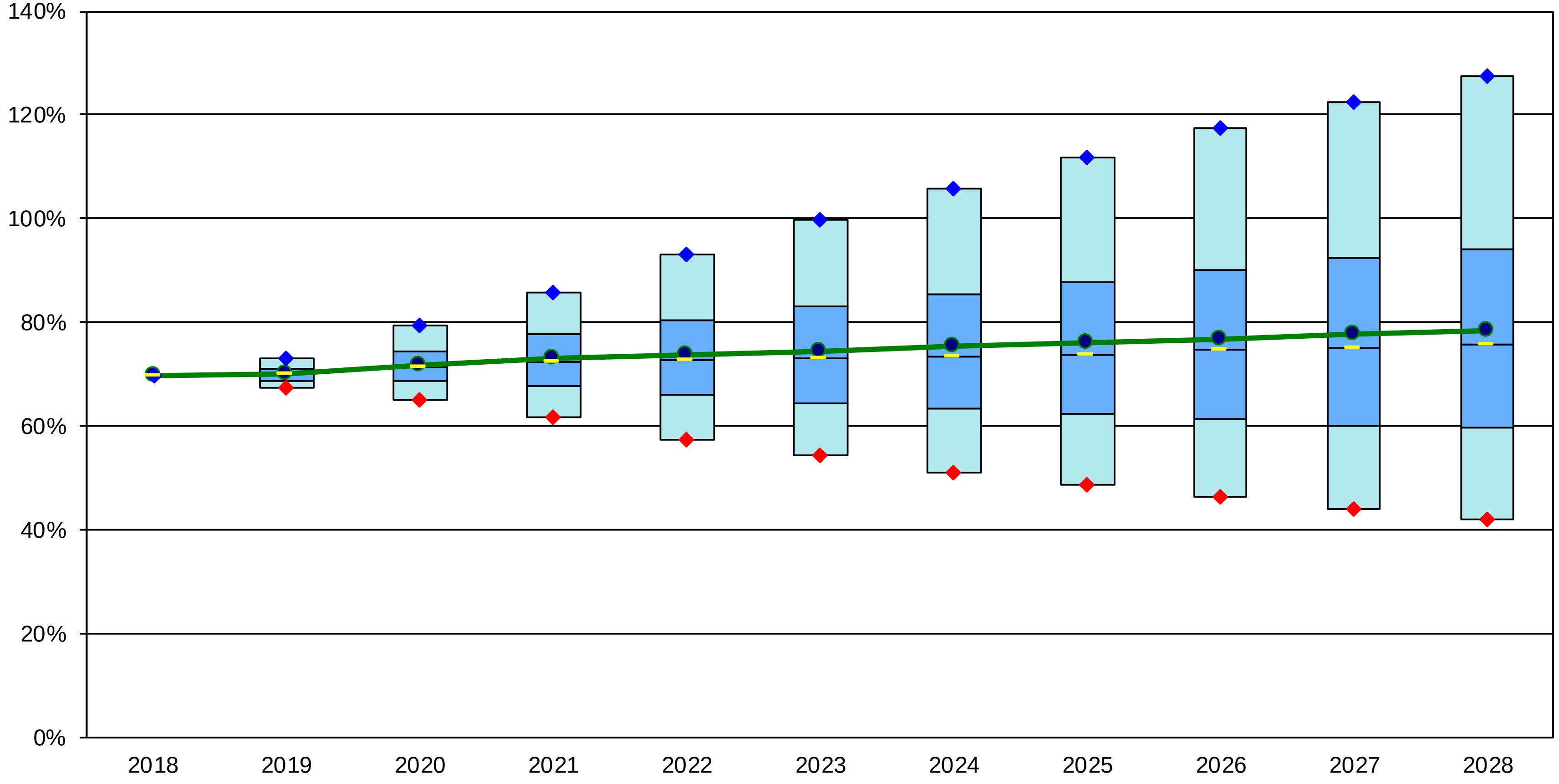
- **Bear market:** 5-year return less than 7.75%: **-1**
- **Bull market:** 5-year return greater than 7.75%: **+1**

* Based on closed amortization period of 30 years, established as of July 1, 2013

Sample Scoring System *(continued)*

- Total summary score could range from -1 to +7
  - 0 to 6 score based on plan metrics (Criteria 1 through 3)
    - Additional +1 or -1 based on where the economy is in the current market cycle (Criteria 4)
  - Further stratification can be used as well
- Recommendation for action is based on the total summary score. Summary "health" can be summed up as follows:
  - **Green** (summary score of -1 to 2) to indicate *"all clear"*
  - **Yellow** (summary score of 3 to 5) to indicate *"closely monitor"*
  - **Red** (summary score of 6 or 7) to indicate *"take action"*

Criteria 1 and 2 – Current and Projected Funded Ratio (Sample)

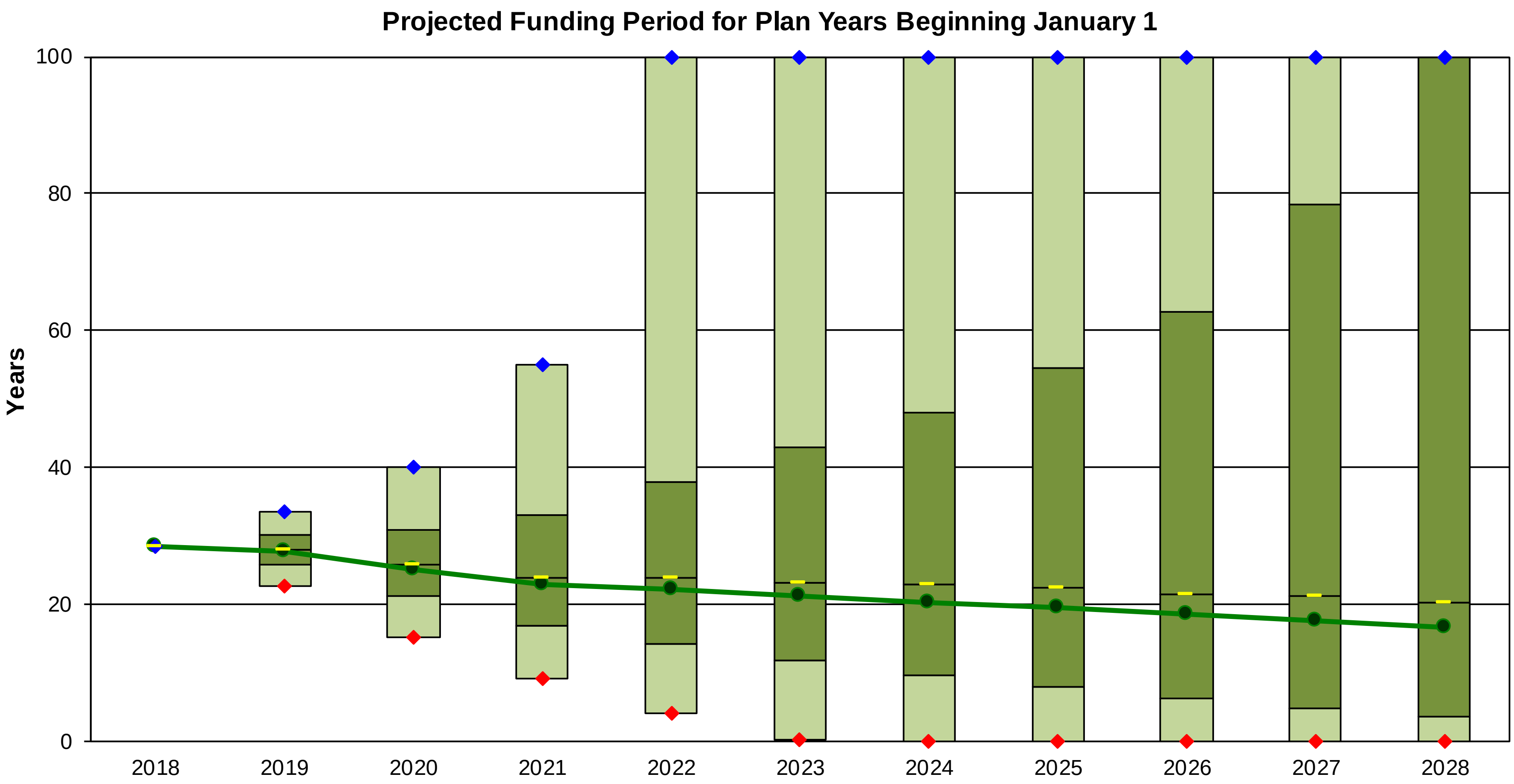


Projected Funded Ratio as of January 1

◆ 95th	70%	73%	79%	86%	93%	100%	106%	112%	117%	123%	128%
▬ 75th	70%	71%	74%	78%	80%	83%	85%	88%	90%	92%	94%
▬ 50th	70%	70%	71%	73%	73%	73%	73%	74%	75%	75%	76%
▬ 25th	70%	69%	69%	68%	66%	64%	63%	62%	61%	60%	59%
◆ 5th	70%	67%	65%	62%	57%	54%	51%	49%	46%	44%	42%
●	70%	70%	72%	73%	74%	74%	75%	76%	77%	78%	78%

● Baseline deterministic projection with proposed assumption changes using current 8.00% investment return assumption

Criteria 3 – Projected Funding Period (Sample)



◆ 95th	28.3	33.5	40.1	54.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
▬ 75th	28.3	30.2	30.8	33.0	37.9	42.9	48.0	54.6	62.7	78.4	100.0
▪ 50th	28.3	28.0	25.6	23.8	23.7	23.1	22.9	22.4	21.4	21.1	20.2
▬ 25th	28.3	25.8	21.0	16.9	14.0	11.6	9.6	7.9	6.2	4.6	3.4
◆ 5th	28.3	22.7	15.2	9.2	4.1	0.1	0.0	0.0	0.0	0.0	0.0
●	28.3	27.7	25.0	22.9	22.0	21.2	20.3	19.4	18.5	17.6	16.6

● Baseline deterministic projection with proposed assumption changes using current 8.00% investment return assumption

Criteria 4 – Historical Returns

- Rates of return on market value of assets, gross of fees, as calculated by Segal
  - 9.0% for year ending 6/30/18
  - 5-year average is 8.2%
  - 10-year average is 5.5%

Calculating the Summary Score (Sample)

Criteria 1

Current year funded ratio is 66%

- **Ideal condition:** 85% or higher
- **Problematic condition:** Less than 60%

Intermediate condition met

+1

Criteria 2

For illustration, projected 25th percentile funded ratio in 10 years is 59%
For illustration, projected 50th percentile funded ratio in 10 years is 76%

- **Ideal condition:** 90% or higher with 75% probability
- **Problematic condition:** Less than 60% with 50% probability

Result is between ideal and problematic

+1

Criteria 3

For illustration, projected 50th percentile funding period in 10 years is 20.2 years

- **Ideal condition:** At or below 19 years with 50% probability
- **Problematic condition:** Above 30 years with 50% probability

Result is between ideal and problematic

+1

Criteria 4

Trailing 5-year average return is 8.2%

- **Bear market:** 5-year return less than 7.75%
- **Bull market:** 5-year return more than 7.75%

Currently in a bull market cycle

+1

4

Calculating the Summary Score *(continued)*

- Composite summary score equal to **4**

Assessment:

Summary score of -1 to 2: **No action necessary**

Summary score of 3 to 5: **"Alert" status; additional monitoring required**

Summary score of 6 to 7: **Changes should be considered**

Based on a summary score of 4, Plan is: Yellow

Using the Plan Management Policy

- Recalculate Policy Score as part of the annual valuation or other frequency
- Policy Score provides context for likelihood of future positive or negative events
  - For example, if funded ratio is projected to be at an unacceptable level with a high likelihood, the Board can explore ways to address this
- Policy Score can be part of the actuarial analysis of proposed legislation
  - Does the Policy Score improve, stay the same, or worsen?
  - Allow a benefit improvement as long as Policy Score does not decrease?

Project Phases

- Proposed project would consist of two phases

- Phase 1 – initial risk assessment and stochastic modeling
  - Baseline liabilities, normal costs, and benefit payments projected using an open group forecast
  - Combination of stochastic and deterministic projections to evaluate financial health of TFFR

- Phase 2 – develop Plan Management Policy
  - Identify Policy metrics and establish “ideal” and “problematic” conditions
  - Construct a scoring system with the idea of meeting TFFR’s long-term funding goals
  - Discuss and fine-tune Policy and scoring system

Additional Thoughts

- Stochastic modeling is currently a best practice for understanding the overall financial health of a retirement system
- Plan Management Policy concept is an emerging best practice
- Both are consistent with the idea of transparency and risk assessment
- Plan Management Policy gives the Board the ability to be proactive as opposed to reactive

North Dakota
Teachers' Fund For Retirement

MEMORANDUM

TO: **TFFR Board**

FROM: **Fay Kopp**

DATE: **January 17, 2019**

SUBJ: **Segal Proposal**
Actuarial Contract Extension

As fiduciaries, the TFFR Board has a duty to select plan consultants prudently, and once selected, to monitor the quality of their work regularly. Trustees also have an obligation to review the fees paid to those service providers periodically to ensure that the fees are reasonable.

Over the last 10 years, actuarial fees paid to TFFR's actuarial consultant, Segal Consulting, have averaged about $122,000 per year (Attachment 1). For the fiscal year ending June 30, 2018, actuarial fees paid ($71,500) were less than .003% (3/1000 of 1%) of market value of TFFR assets ($2.5 billion). Actuarial costs are largely impacted by legislative proposals, special studies, compliance issues, and board initiatives.

Segal has been TFFR's actuarial consultant since 2011. Kim Nicholl and Matt Strom have been the two primary consultants for TFFR, and have appeared before the Board and legislative committees to present actuarial valuations, GASB reports, experience studies, and board education on actuarial issues. Melanie Walker has also provided assistance regarding technical compliance issues and helped TFFR submit an application to the IRS for a determination on the qualification status of the plan. These individuals are backed by a strong Segal team of actuaries, analysts, and research staff in an actuarial consulting firm that has a solid reputation and large presence in the public sector.

In 2016, the TFFR Board hired Cavanaugh Macdonald Consulting to conduct an actuarial audit of the annual valuation conducted by Segal. Results were very positive with only a few minor recommendations. This provides assurance that Segal is accurately performing TFFR actuarial calculations and valuations and their work is being done in accordance with actuarial standards.

In 2017, the TFFR Board requested competitive bids for the actuarial consulting contract. The Board awarded Segal with the contract for the July 1, 2017 – June 30, 2019 time period, with the option to renew the contract for additional two-year periods.

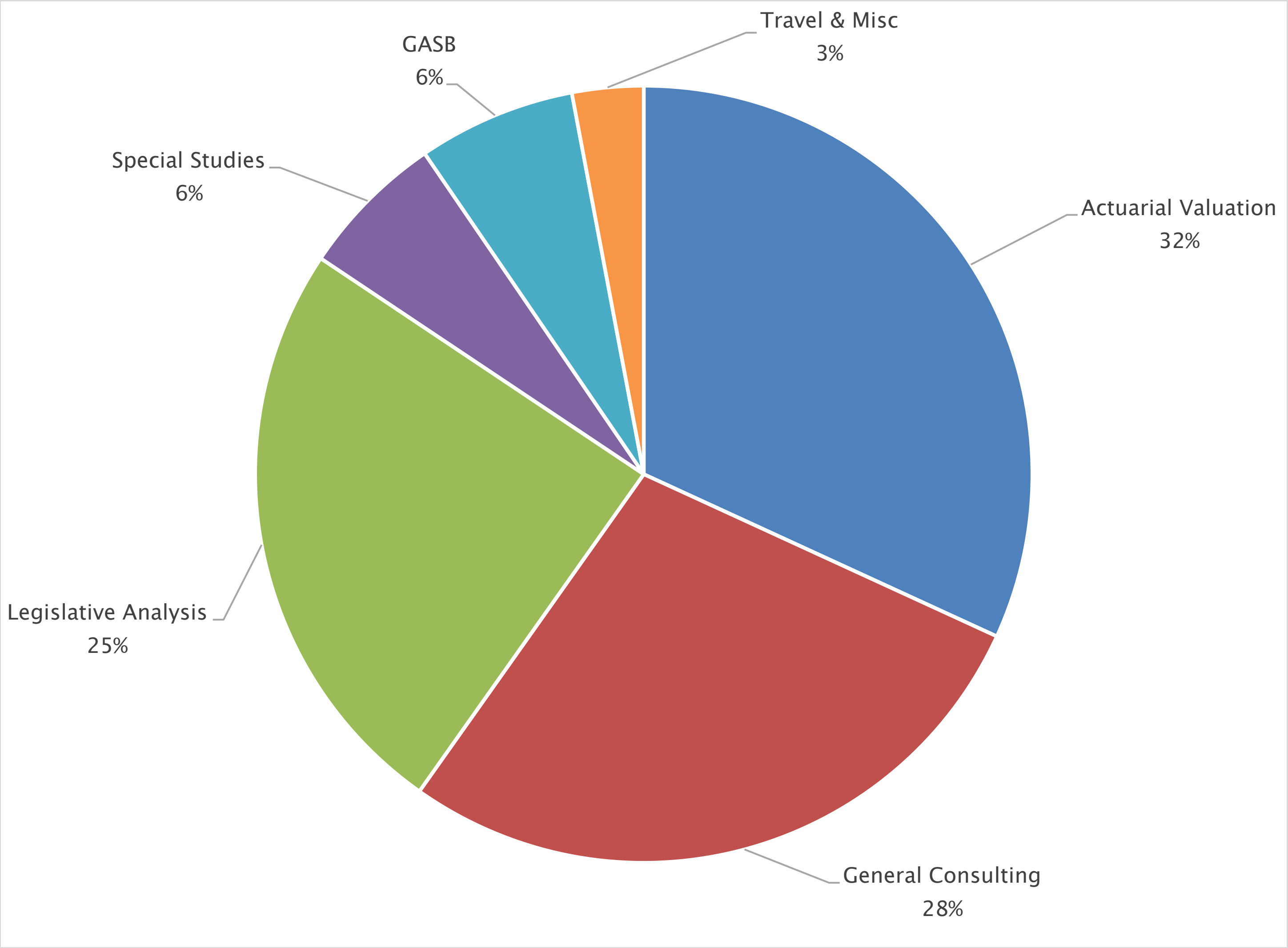
Segal has provided a proposal dated January 8, 2019 to extend their actuarial consulting contract for an additional two years (attached). Segal's proposal includes two annual actuarial valuations (fixed fee of $44,000 each for 2019 and 2020 compared to $42,000 and $43,000 for 2017 and 2018 respectively); two GASB 67/68 Reports (fixed fee of $8,000 each for 2019 and 2020, no cost increase from 2017 and 2018); Experience Study (fixed fee of $35,000 for 2019 experience study compared to $33,000 for 2014 study); and other consulting services at an hourly rate of $305 per hour (compared to $300 hour for 2017-19). Combined, the 2-year contract cost increase is about 2.0%.

Board Action Requested: Board motion to accept Segal's proposal to extend TFFR's actuarial consulting contract with Segal for 2019-21 as outlined in their January 8, 2019 letter.

ND TEACHERS' FUND FOR RETIREMENT
ACTUARIAL CONSULTING FEES PAID – SEGAL CO.
July 1, 2008 – June 30, 2018

Fiscal Year	Total Bill	Actuarial Valuation	General Consulting	Legislative Analysis	Special Studies (Fixed Fee)	GASB	Travel & Misc. Expenses
2009	$ 81,542	$ 34,500	$ 28,538	$ 14,767			$ 3,737
2010	$ 196,991	$ 36,000	$ 35,141	$ 84,736	$ 37,000		$ 4,114
2011	$ 254,290	$ 37,400	$ 26,985	$ 183,987			$ 5,918
2012	$ 93,777	$ 40,584	$ 43,112	$ 1,855			$ 8,226
2013	$ 94,848	$ 35,946	$ 39,551	$ 14,381			$ 4,970
2014	$ 71,264	$ 40,380	$ 8,050	$ 140		$ 16,894	$ 5,800
2015	$ 123,367	$ 39,355	$ 20,207	$ 980	$ 37,470	$ 24,430	$ 925
2016	$ 144,633	$ 41,720	$ 81,820	$		$ 21,093	$
2017	$ 91,742	$ 42,811	$ 36,316	$		$ 9,956	$ 2,659
2018	$ 71,499	$ 41,189	$ 22,310	$		$ 8,000	$
Totals	$ 1,223,953	$ 389,885	$ 342,030	$ 300,847	$ 74,470	$ 80,373	$ 36,348

ND TEACHERS' FUND FOR RETIREMENT
ACTUARIAL CONSULTING FEES PAID – SEGAL CO.
July 1, 2008 – June 30, 2018



SEGAL

101 North Wacker Drive Suite 500 Chicago, IL 60606-1724
T 312.984.8527 www.segalco.com

January 8, 2019

VIA E-MAIL

Ms. Fay Kopp
NDRIO Deputy Executive Director / NDTFFR Chief Retirement Officer
ND Retirement & Investment Office | ND Teachers' Fund for Retirement
3442 East Century Avenue | P.O. Box 7100
Bismarck, ND 58507-7100

Re: **Proposal to Continue Providing Actuarial and Consulting Services for the North Dakota Teachers' Fund for Retirement for the period July 1, 2019 to June 30, 2021**

Dear Fay:

Segal Company is pleased to submit this proposal to continue performing professional actuarial and consulting services for the North Dakota Teachers' Fund for Retirement ("TFFR" or "Fund") for the period July 1, 2019 to June 30, 2021. Segal has been serving in this capacity to TFFR since 2011 and we look forward to continuing to build upon the relationship we have established with you. We believe that we have demonstrated our ability to provide quality, timely and accurate consulting advice. Our proposal describes our qualifications and experience and demonstrates our continued commitment to deliver strategic and technical insight in a responsive manner. Our fees are included as an attachment in the back of this proposal.

Consulting Services and Deliverables

Segal has the experience to continue providing a full range of actuarial consulting services to TFFR. Under this engagement, we understand that the consulting services include, but are not limited to the following.

1. Prepare annual pension valuation.

2. Prepare actuarial calculations and disclosures needed for GASB 67 and GASB 68.

3. Provide actuarial and technical analysis of proposed legislation.

4. Provide actuarial factors, tables and other calculations as required.

5. Assist with the ongoing administration of TFFR, including the review and calculation of benefits, service purchases, QDROs, and other calculations.

6. Assist with the development of procedures, forms, publications, tables, and computer systems.

7. Provide information and assistance with Federal and State tax issues affecting TFFR plan, members, and employers.

8. Summarize and discuss actuarial and administrative implications of federal and state laws and rules governing TFFR.

9. Develop and implement statutes, rules, policies, and procedures.

10. Provide periodic educational presentations or discussions with TFFR Board, staff, legislative committees, or others, as requested.

11. Assist with compliance issues related to federal rules and regulations for qualified defined benefit government pension plans including minimum participation rules, Section 415 limits, maximum compensation limits, maximum benefit limits, minimum distribution requirements, tax withholding, and other federal and Internal Revenue Code requirements for qualified plans.

12. Provide asset/liability modeling support work as requested.

13. Provide assistance with special projects or studies as requested.

14. Conduct experience studies as requested.

Our consulting approach is ideally suited to meeting the needs and objectives of TFFR. While we will draw upon our years of experience with TFFR as well as other public sector retirement systems, with the diverse talents of our actuaries, consultants, and other professionals, we will also focus upon the particular environment in which TFFR functions. We will seek to be innovative and to recognize the special needs and requirements of TFFR, rather than to replicate a particular approach just because it happened to work well in another situation in a different state.

Timeline

Following is a timeline containing various tasks and deliverables for the project, as well as target completion dates for each step.

Service Element	Time Frame	Methodology
Valuation Consulting Services		
Planning meeting: discussion for plan year beginning July 1	July	Discussion with the TFFR staff to plan the engagement and to establish timeframes and expectations for delivery of services.
Actuarial data request	July	Instructions/discussions concerning the actuarial data required for conducting the actuarial valuation.
Program review and update	July – August	Actuarial valuation programs will be updated as necessary (e.g., enacted legislative changes) and accuracy tests performed (including test lives).
Actuarial data review and actuarial valuation processing	August – September	Resolution of any data questions. Processing of actuarial valuation.
Financial data review and actuarial values/results calculated	First week of September	Determination of actuarial value of assets, valuation results, and contribution rates.
Preliminary valuation results	Early October	Preliminary valuation results provided to TFFR staff.
Preparation of GASB 67 and 68 report	October	Disclosure of items required by GASB 67 and 68. The final GASB 67 and 68 report will be delivered by the end of October.
Draft valuation report to TFFR	First week of October	Draft report will be forwarded to TFFR for review, prior to the release of final report.
Final valuation report delivered	No later than October 15	The final report will be delivered within a week after approval of the draft report by TFFR.
Presentation of report	October Board meeting and October LEBPC meeting	Preparation of PowerPoint presentations and handouts to present to the TFFR Board and LEBPC.
Attend Board meetings	As needed	Respond to inquiries and present information.

Service Element	Time Frame	Methodology
Consulting Services and Projections		
General consulting services	As requested	Delivery of these consulting services will depend on the nature of the issue. In most instances, we anticipate to be able to provide these services by telephone, through written and electronic correspondence or a combination of both. Where appropriate and as requested by TFFR, we will attend scheduled meetings to deliver these services.
Assist with legal compliance and communications	As requested	Assist with drafting plan documentation.
Actuarial tables and factors	As requested	We will make recommendations for necessary or appropriate changes.
Projection services	As requested	The general projection studies performed during the year illustrating the impact of emerging experience or assumptions will balance the sophistication needed to accomplish the projections with TFFR required timing for the results. Any projections of population and pension costs will be performed showing alternative assumptions (e.g., number of actives, investment return) in consultation with TFFR. Results will be presented at the Board meeting as desired by TFFR.
Proposed legislative benefit changes:		
(a) Review of proposal (if possible, a copy of the actual bill draft is preferred)	Upon receipt	For most typical benefit change proposals, we are able to provide a review within five working days of the request. During the legislative session, we will provide the initial review within one day.
(b) Preliminary review and assessment of time requirement to complete	Upon receipt	For more complicated benefit modification proposals, a timeframe of providing our responses within 10 working days may be warranted.
(c) Delivery of actuarial and cost analysis	As requested by TFFR – generally within 1-10 working days	We will prepare actuarial and cost analyses as requested.

Service Element	Time Frame	Methodology
Improvements in financing and benefits structure	Ongoing	The Segal Company actively participates in a variety of national public sector retirement organizations, including NASRA, NCTR, NAGDCA, NCPERS, and the pension related activities of the GFOA, GASB and the NCSL. We also engage in independent research activities through which we monitor new and creative efforts of state retirement systems to enhance their funding and benefit structures. We will inform TFFR of new developments and their applications and potential impact on a proactive basis through a combination of direct communications and our governmental benefits bulletins.
Drafting legislation and related services	As requested	We will assist TFFR staff in drafting proposed changes to existing retirement laws.
New developments and federal legislation	Ongoing	Segal Consulting closely monitors federal legislative and regulatory activity impacting the design, funding and operations of public sector retirement plans. Through a combination of activities of our National Market Leader, Legal Research Division and public sector pension consultants and actuaries, we will be able to provide to TFFR a current outlook on these federal activities and issues. We actively participate in the National Association of Public Pension Attorneys and maintain independent contacts with legal Counsel for NCTR and with legislative staff members of the NASRA and GFOA.
Specifications for data files	Ongoing	We will review the proposed form and content of the data files and make suggestions for appropriate modifications.
Special benefit cases	As requested	These services will be performed on an as needed basis for TFFR.
Experience study	Fall 2019	Analyze experience for period July 1, 2014 to June 30, 2019.
Educational presentations	As requested	Segal will include topics on public sector plans in each valuation presentation and is available to provide other educational presentations as requested.

Project Team

Segal Consulting has assigned experienced professional actuaries to the valuation tasks.

A dedicated team of actuaries and consultants that are familiar with TFFR will continue performing the work associated with the contract. We believe that our team structure and our actuarial processes provide adequate resources to complete the work within the requisite timeframe while permitting adequate sharing of information and having familiarity with all aspects of the assignment. Our TFFR team will continue to be led by Kim Nicholl and Matt Strom, who will serve as Co-Lead Actuaries. Matt will also continue to serve as peer review actuary, and Tanya Dybal will continue to serve as reviewing actuary. The team will also include actuarial analysts who will perform most of the data reconciliation and valuation work. To the extent that additional special assignments are requested, we have numerous additional actuaries and other staff to draw upon.

An organizational chart for the project team is shown below:

Kim Nicholl, FSA, FCA, MAAA, EA
Senior Vice President and Consulting Actuary
Chicago, IL

Matt Strom, FSA, MAAA, EA
Vice President and Consulting Actuary
Chicago, IL

Supporting Resources

Retirement

Tanya Dybal, FSA, MAAA, EA
Actuary
Chicago, IL

Jakob Nolan
Actuarial Associate
Chicago, IL

Compliance

Melanie Walker, JD
Senior Vice President, National Compliance
Denver, CO

Administration

Paul Pappageorge
Manager, Benefits Administration
Chicago, IL

Experience Study

A five-year experience study will be performed beginning with the completion of the July 1, 2019 actuarial valuation. The five-year experience analysis report will include recommendations regarding all actuarial assumptions, including but not limited to rates of termination, service retirement rates, progression and promotion salary scales, pre- and post-retirement mortality, disability rates, rates of termination from disability, as well as economic assumptions such as inflation and investment return. Our study will also reflect appropriate process changes recommended in connection with the most recent actuarial audit of TFFR.

We will maintain the participant data necessary to complete this experience analysis from our annual valuation databases. We have completed experience analyses for many statewide pension systems as well as an analysis for TFFR in 2014. Our familiarity with the process enables us to provide customized and efficient results with a perspective that other firms are unable to offer.

Segal performs experience reviews for our public sector retirement clients, typically every three to five years.

Summary

Segal would be privileged to continue to be retained as the consultant for TFFR. We bring a useful balance of technical depth and strategic sense to this project and believe that our recommendations will help the Fund address the future of its retirement program.

We appreciate the opportunity to offer this proposal and will be pleased to meet with you to discuss this material or provide additional materials and explanations as needed.

Sincerely,

Kim Nicholl

Matthew A Strom

Kim Nicholl, FSA, EA, FCA, MAAA
Senior Vice President & Consulting Actuary

Matthew A. Strom, FSA, EA, MAAA
Vice President & Consulting Actuary

Attachment: Cost Proposal

COST PROPOSAL
ACTUARIAL AND CONSULTING SERVICES
ND TEACHERS' FUND FOR RETIREMENT
JULY 1, 2019 – JUNE 30, 2021

2 YEAR CONTRACT COST	**FIXED FEE**	
2019 Actuarial Report	$44,000	
2020 Actuarial Report	$44,000	
2019 GASB 67/68 Report	$8,000	
2020 GASB 67/68 Report	$8,000	
2019 Experience Study	$35,000	
TOTAL FIXED FEES:		**$139,000**

Note: Total fixed fees include presentation of valuation reports to TFFR Board and LEBPC each year, plus a presentation of the experience study to TFFR Board. Travel expenses are not included in the fixed fee and will be reimbursed upon approval.

2 YEAR CONTRACT TERM	**FIXED HOURLY FEE FOR SERVICES**	
Legislative and General Consulting	$ 305 per hr. X 350 est. hrs. =	**$106,750**

TOTAL FIXED FEES AND HOURLY FEES FOR 2 YEAR CONTRACT: $245,750

Segal is fully aware of the sensitivity of budget allocations for public sector employers. Our pricing approach is focused toward achieving the client's objectives in the most cost-effective manner consistent with quality, accuracy, and timeliness. If our proposed fees are inconsistent with your understanding of the engagement, we request the opportunity to explain our pricing assumptions or to modify the scope of services to best fit your objectives for this important assignment.

Our fixed fees are determined based on an estimate of the time needed by our professional staff to complete the tasks required and the expertise of the staff involved. We make every effort to assign tasks to the appropriate professional level staff member to assure timely and accurate completion of the work.

Our fees are all-inclusive and there are no additional administration, start-up, or implementation fees associated with the engagement. We do not bill separately for services performed by our clerical staff, duplicating, telephone calls, computer time, postage, etc. In situations where additional projects can have a project scope outlined in advance, we can devise an agreed-upon fee quote prior to beginning work if so desired.

North Dakota Teachers' Fund For Retirement

MEMORANDUM

TO: **TFFR Board**

FROM: **Fay Kopp**

DATE: **January 17, 2019**

SUBJ: **Segal Proposal**
Stochastic Projections and Plan Management Policy

As fiduciaries, the TFFR has the duty to monitor the financial soundness of the pension plan and recommend changes, if necessary. In recent years, some public pension plans around the country are conducting comprehensive risk assessments, preparing stochastic projections, and developing a plan management policy. This is being done to provide a basis for balancing pension obligations with current assets and expected future contributions in order to maintain the plan's long-term financial health and sustainability. A plan management policy could also provide a framework for the Board to follow in establishing metrics for proposing future funding and benefit changes, if needed.

This topic was initially presented by Segal as Board Education at the October 25, 2018 meeting at which time the Board requested a proposal including project plan, timeline, and cost for Board consideration.

Segal will summarize their proposal in a presentation to the Board at the January meeting. The Segal presentation and proposal is currently being finalized and will be added to the website as soon as it is completed (prior to the meeting).

Board Action:

If the Board wants Segal to proceed with this project, Board motion to accept Segal's proposal to develop stochastic projections and plan management policy as outlined in their January 2019 letter.

If the Board does not wish to proceed with the project at this time, no Board action is necessary.

Segal Consulting

101 North Wacker Drive Suite 500 Chicago, IL 60606-1724
T 312.984.8500 www.segalco.com

January 15, 2019

Via E-Mail

Ms. Fay Kopp
NDRIO Deputy Executive Director / NDTFFR Chief Retirement Officer
ND Retirement & Investment Office | ND Teachers' Fund for Retirement
3442 East Century Avenue | P.O. Box 7100
Bismarck, ND 58507-7100

Re: **Proposal to Develop a Plan Management Policy**

Dear Fay:

We are pleased to present this proposal to develop a Plan Management Policy ("Policy") for the North Dakota Teachers' Fund for Retirement ("TFFR" or "Fund"). The objective of the Policy is to provide a basis for balancing the Fund's obligations with current assets and expected future contributions in order to maintain its long-term health and viability. The Policy would also provide the framework the Board will follow in establishing metrics for future funding and benefit changes. There are several financial measures that can be used to assess this balance and the Board will utilize those measures they believe to be appropriate for this purpose.

Concepts for a Statement of Pension Plan Management Policy

The Policy will include a list of risks to primary stakeholders of TFFR and a description of each. These risks include risks related to economic variables (e.g., investment return, inflation, etc.), risks related to demographic events (e.g., mortality, longevity, payroll/population growth, etc.), and risks related to external forces (e.g., governance risk, regulatory risk, litigation risk, etc.).

An actuarially determined contribution (ADC) requirement is used as a benchmark to compare to the statutory contribution rate. An ADC reflects an asset valuation method (i.e., smoothing method), actuarial cost method (e.g., entry age normal), and amortization method for paying down unfunded liabilities or recognizing surplus assets. The current TFFR funding policy relies on an ADC[1] that is equal to the sum of (a) the employer normal cost rate and (b) the level

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[1] *The TFFR ADC should be reviewed periodically (e.g., as part of the experience review cycle) to ensure that the benchmark contribution rate continues to be appropriate. However, for purposes of this proposal, we are not contemplating a review of the ADC at this time.*

percentage of pay required to amortize the unfunded actuarial accrued liability over the 30-year closed period that began July 1, 2013 (25 years remaining as of July 1, 2018). The ADC should be compared to the statutory contribution rate (prevailing and ultimate); an ADC that is less than the statutory rate results in a "margin" while an ADC that is greater than the statutory rate results in a "deficit."

Additional key metrics of financial health should also be established. Obvious metrics include the funded percentage (assets ÷ actuarial liability) and effective amortization period (the number of years it is expected to take to fully amortize the unfunded liability based on the current statutory contribution rate). Other metrics to examine might include the "asset volatility ratio" (market value of assets ÷ payroll) and "liability volatility ratio" (actuarial accrued liability ÷ payroll). With respect to the asset volatility ratio, a higher ratio means that the ADC experiences more volatility due to investment returns than a lower ratio. Similarly, with respect to the liability volatility ratio, a higher ratio means that the ADC experiences more volatility due to changes in liability than a lower ratio.

A "dashboard" of these metrics as of the valuation date will be one way to measure the Fund's current health. However, projections should also be used to give a clearer picture of the Fund's health over the longer-term. For example, "is the funded percentage expected to increase or decrease over time?" Deterministic projections are useful for examining simple "what if" scenarios; "if all assumptions are met, what happens to the funded percentage?" Stochastic projections provide a broader context of the projected financial health of the plan by answering questions such as, "what is the probability that the projected funded percentage exceeds a certain level in the future?"

The Policy will contain parameters that establish desirable outcomes of certain metrics and projections. Segal will work with the Board and TFFR staff to develop the Policy metrics that meet your unique objectives. For example, sample Policy parameters might include:

- Over the next ten years, the funded percentage is projected to increase by ten percentage points with 75% probability.

- Over the next five years, the effective amortization period is projected to decline by four years with 75% probability.

A scoring system will be developed that prioritizes those metrics that are most important to the Board in evaluating the health of the Fund. When the results of metrics or projected values exceed stated thresholds, the score will be favorable. Conversely, when the results are below desired results, the score will be unfavorable. We will work with the Board and TFFR staff to develop a scoring system that best reflects the collective risk tolerance of all parties.

The scoring results might cause the Board to decide to take action relative to pursuing contribution rate increases or other benefit/reform changes. In addition, the Policy might also include parameters that outline acceptable criteria for lowering statutory employer and/or member contribution rates, or providing benefit improvements. For example, "a contribution rate can be decreased so long as the Policy score does not fall below X."

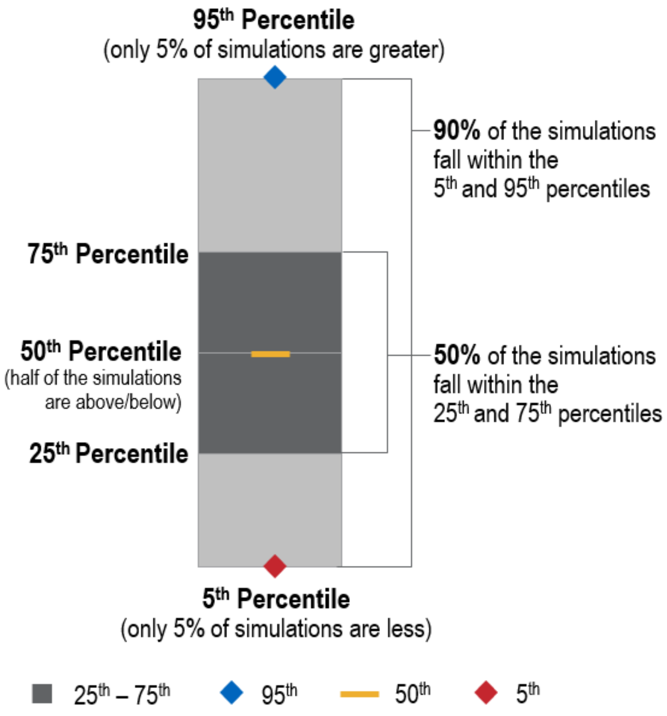
Stochastic Modeling

Stochastic modeling is a critical element of designing and monitoring a Plan Management Policy. Under this approach, simulated investment portfolio returns are modeled based upon the current target asset allocation. Simulated investment returns can be used to model projected funded percentage, projected effective amortization period, and projected ADCs, among other outputs. Our projections will show results for 20 years. We will summarize all output into the following percentiles: 5th, 25th, 50th, 75th, and 95th. Additional (more granular) probabilities of meeting various thresholds can be developed using the underlying projection data.

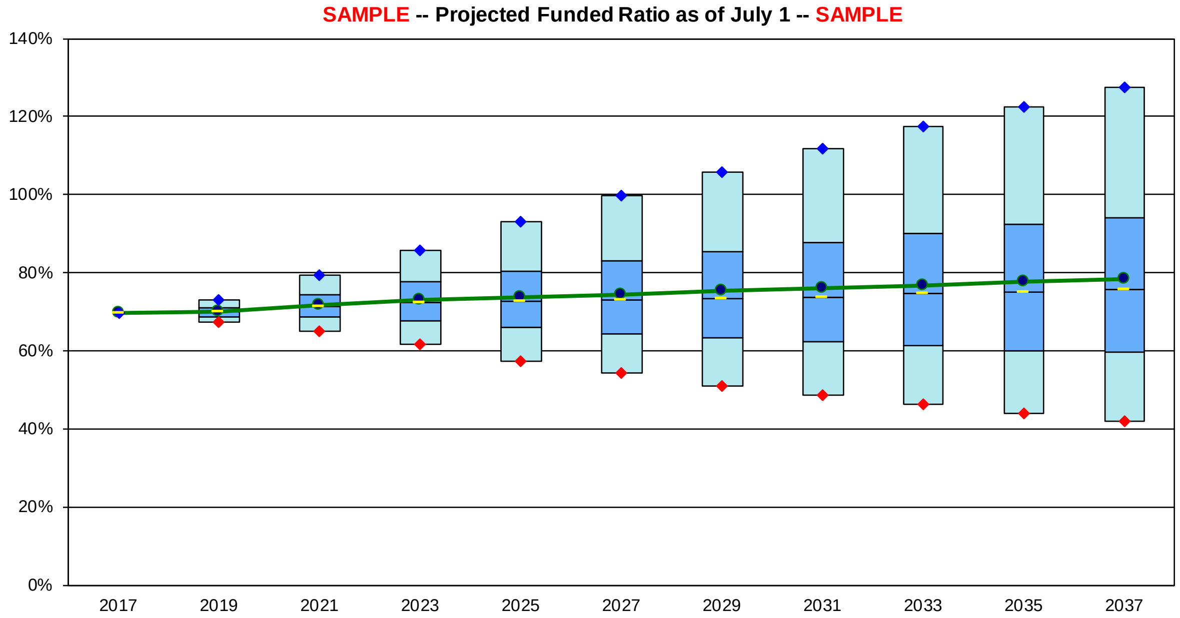
Output data is grouped into percentiles and summarized as a range:

- **Best Case**: Better cases would occur only 5% of the time (above the 95th percentile in the example shown on the following page)
- **Most Likely**: Better or worse cases (50th percentile) are equally likely
- **Worst Case**: Worse cases would occur only 5% of the time (below the 5th percentile in the example shown on the following page)

Sample
Funded Ratio



An illustrative output graph is shown below:



◆ 95th	70%	73%	79%	86%	93%	100%	106%	112%	117%	123%	128%
— 75th	70%	71%	74%	78%	80%	83%	85%	88%	90%	92%	94%
-- 50th	70%	70%	71%	73%	73%	73%	73%	74%	75%	75%	76%
— 25th	70%	69%	69%	68%	66%	64%	63%	62%	61%	60%	59%
◆ 5th	70%	67%	65%	62%	57%	54%	51%	49%	46%	44%	42%
●	70%	70%	72%	73%	74%	74%	75%	76%	77%	78%	78%

● Baseline deterministic projection

In this particular chart (taken from another study for illustrative purposes), the results show, for example, that in 2037 there is a 25% probability that the funded ratio will be less than 59%, a 50% probability that the funded ratio will exceed 76%, and a 50% probability that the funded ratio will fall between 59% and 94%. Original trial detail will be retained in our files should the need for studying additional percentile results arise.

Proposed Approach for Stochastic Modeling

The primary inputs into the portfolio returns modeling are Capital Market Assumptions[2] (CMA), which provide mean returns, standard deviations, and correlation coefficients for the various asset classes in the target asset allocation. Based on the CMA inputs, we will project portfolio returns for 20 years, for 5,000 simulations of the target asset allocation. These 5,000 simulations will be loaded into our modeling software, generating 5,000 projections for the Fund. These projections can be used to develop a distribution of results, which, in turn, can be translated into the likelihood of obtaining a given result. For example, "there is a 50% chance that the funded percentage in five years will be above or below X%, a 25% chance that is could be Y% or above, and a 5% chance that it might be as high as Z%."

Projected liabilities and normal costs will be generated with an open group liability forecast. In an open group forecast, liabilities and benefit payments in future years are developed by the actuarial software based on projected plan demographics in each future year. Given the complexity of the benefit structure and participant demographics (e.g., multiple plan tiers with different benefit eligibilities), an open group liability forecast containing a new entrant profile to "replace" decrementing members provides the highest degree of precision. Other liability forecasts that rely on rolling forward current year valuation liabilities are reasonable for certain purposes, but would compromise the credibility of this stochastic analysis.

Project Outline/Timeline

Developing the Policy will require two project phases.

Phase 1 – Phase 1 will consist of the initial risk assessment and stochastic modeling. Baseline liabilities, normal costs, and benefit payments will be projected using an open group forecast assuming a level active population. Assets will be projected based on the current target asset allocation.

This phase will assess the health of TFFR, using stochastic projections of future funded levels. Deterministic projections will also be used within the risk assessment context to evaluate how the TFFR funded level reacts under a series of predetermined scenarios. Possible scenarios include:

- How do the projections change if the investment performance for the next ten years equals the 25th percentile returns?
- What level of return in fiscal 2019 would result in a 10% increase in the 2020 ADC?
- How do the projections change if life expectancy increases by one year?
- How do the projections change if salary increases are greater than expected?
- How do the projections change if retirements increase by 10%?

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[2] *We can use CMAs from either Callan Associates (the State Investment Board's investment consultant) or the 2018 Horizon Survey of Capital Market Expectations; we will discuss which assumptions to use prior to commencing the engagement.*

Phase 1 will conclude with a meeting with the Board to present the results of the risk assessment and projection modeling.

Phase 2 – Using the results of the projections and modeling from Phase 1, Segal will work with TFFR staff to develop a means to monitor the Policy going forward. “Ideal” and “problematic” conditions for various metrics will be established and a scoring system will be constructed with the idea of meeting TFFR’s long-term funding goals. Once a preliminary approach to monitoring and scoring the Policy is developed, Segal and TFFR staff will meet with the Board. Collectively, aspects of the scoring system will be discussed and fine-tuned. Subsequent to that meeting, the Segal team will make any required modifications and a final report will be drafted.

Timeline – Below is an outline of a proposed timeline to complete both phases of the project.

Task	Target Date
Phase 1	
Kickoff call with TFFR staff to discuss any unique scenarios to be included in the initial analysis	Shortly after acceptance
Initial risk assessment and modeling completed by Segal	End of February
Preliminary projection results shared with TFFR staff and any additional scenarios discussed	End of March
Additional projections, if any, completed by Segal	Second week of April
Meeting with the Board to present Phase 1 results	April 25, 2019
Phase 2	
Segal and TRS staff discuss broad approach for Policy monitoring parameters	By the middle of May
Development of preliminary scoring system completed by Segal and approved by TFFR staff	End of June
Meeting with the Board to discuss Phase 2 progress and review draft scoring system elements	July 25, 2019
Final Phase 2 report submitted for Board approval	End of August

Proposed Fees

Our proposed fees are based upon the expected number of hours expended and the hourly rates in the current contract.

- Phase 1 – the expected cost to complete Phase 1 is $36,500
- Phase 2 – the expected cost to complete Phase 2 is $32,500

The quoted fees are "not to exceed" amounts. If any "out of scope" analysis is requested, we will identify the additional expected cost and provide a separate fee quote.

We will commence work immediately upon acceptance of this agreement with a target completion of late August. Our proposed fees are inclusive of two meetings in Bismarck to discuss and present the results and findings.

Please contact us if you have any questions or comments.

Sincerely yours,

Kim Nicholl

Kim M. Nicholl, FSA, EA, FCA, MAAA
Senior Vice President & Consulting Actuary

Matthew A Strom

Matthew A. Strom, FSA, EA, MAAA
Vice President & Consulting Actuary

North Dakota Teachers' Fund For Retirement

MEMORANDUM

TO: **TFFR Board**

FROM: **Fay Kopp**

DATE: **January 18, 2019**

SUBJ: **2019 Legislative Update**

Attached is the January 18, 2019 TFFR Legislative Update. A few notes about the bills:

- HB 1044: TFFR Technical Corrections – SUPPORT
  (January 2019 testimony attached)
- HB 1499: Leg Employee Benefits Programs Committee Duties – NO POSITION
  Board should consider taking a formal position on this bill.
  (October 2018 Segal analysis and testimony attached)
- HB 1500: Higher Ed Governance Structure – MONITOR
- SB 2022: RIO Budget – SUPPORT
  (January 2019 testimony attached)

Other Bills of Interest

- HB 1368: SIB Membership – MONITOR
- HB 1419: PERS DC Plan for New Employees - MONITOR

Retiree Legislative Concerns:

It is also important to note that we have received a number of retiree phone calls, emails, and letters requesting retiree cost of living adjustments, etc. This was particularly strong after the October SIB investment newsletter went out reporting 2018 positive investment performance.

We typically explain that as of the July 1, 2018 actuarial valuation report, TFFR's funding level was about 65%, and our goal is 100%. We remind retirees that teacher and school district contributions were raised significantly and benefits were reduced a number of years ago in order to offset past investment losses and address declining funding levels. While TFFR funding levels are slowly improving due to the legislative changes and positive investment performance in the past few years, it is still expected to take 20-30 years before full funding of the plan's benefit promises. It is the TFFR Board's fiduciary responsibility and highest priority to ensure that adequate funds will be available to pay all promised benefits to current and future retirees for life. Due to plan funding levels, the Board does not plan to request legislative approval of a retiree cost of living increase since it would further increase the liabilities and negatively impact the TFFR fund.

Board Action Requested.

Staff recommends Board take a formal position to oppose HB 1499.

North Dakota
Teachers' Fund For Retirement

TFFR Legislative Update

January 18, 2019

BILL NO. **DESCRIPTION** **SPONSORED/INTRODUCED BY**

HB 1044 **TFFR Technical Corrections** **TFFR Board**

HB 1044 updates TFFR plan language to maintain compliance with federal Internal Revenue Code requirements related to qualified governmental pension plans.

HB 1044 was assigned to House Government and Veterans Affairs Committee. The Committee hearing was held on 1.4.19. The Committee gave the bill a do pass recommendation 14-0. On 1.8.19 the House passed the bill 92 – 0. HB 1044 will now go to the Senate.

HB 1499 **Leg Employee Ben Prog Com Duties** **Rep. M. Ruby, et al**

HB 1499 changes the powers and duties of the Leg Employee Benefits Programs Committee. Only Executive and Judicial branch entities would be required to submit proposed legislation to the Committee for review (including actuarial study); Legislative branch would not be required to do so.

HB 1499 was assigned to the House Government and Veterans Affairs Committee. A Committee hearing has not yet been scheduled.

HB 1500 **Higher Ed Governance Structure** **Rep. Roers Jones, et al**

HB 1500 relates to a new governance structure for the ND University System recommended by the Governor's Higher Ed Task Force. Within the 138-page bill, there are a number of references and language updates to outdated laws regarding college teachers, TFFR, and TIAA-CREF that are no longer applicable since college teachers no longer participate in TFFR. From staff's initial review, we do not believe there is any impact on current and future TFFR plan membership, but we are continuing to review the bill and are working with other interested parties to make this determination.

HB 1500 was assigned to the House Education Committee. A hearing of the Education Committee has not yet been scheduled, but the Legislative Employee Benefits Programs Committee met on 1/15/19 and took jurisdiction over the bill.

SB 2022 **RIO Budget** **Appropriations Committee**

SB 2022 contains the 2019-21 budget authority and continuing appropriations for the Retirement and Investment Office to administer the TFFR retirement program and SIB investment program which is all special funds. RIO's budget request includes maintaining current staffing level (19 FTEs), addition of one new investment position, and approval to spend up to $9.13 million to upgrade or replace TFFR's outdated pension administration system.

SB 2022 was assigned to the Senate Appropriations Committee. The Committee Hearing was held on 1.8.19. A subcommittee was appointed to review the details of the budget, with particular focus on the TFFR pension software project. Subcommittee members: Senator Poolman, Chair, Senator Wanzek, and Senator Robinson.

OTHER BILLS OF INTEREST TO TFFR:

HB 1368 **SIB Membership** **Rep. Kempenich, et al**

HB 1368 makes changes to the membership on the State Investment Board. The bill adds one member of the Legacy and Budget Stabilization Fund Advisory Committee to serve as a nonvoting member of the SIB.

HB 1368 was assigned to the House Government and Veterans Affairs Committee. A Hearing has been scheduled for Friday, 1.25.19 at 8 am in the Ft. Union Room.

HB 1419 **PERS DC Plan for New Employees** **Rep. Steiner, et al**

HB 1419 closes the PERS DB plan in 2025, requires new state employees to participate in the PERS DC plan, provides an option for current employees to transfer from PERS DB plan to DC plan, provides for annual transfer of $20 million from the SIFF, and provides for a Legislative Management Study (with input from a nonbiased, nonprofit third party) during 2019-20.

HB 1419 was assigned to the House Government and Veterans Affairs Committee. A Hearing has been scheduled for Thursday, 1.24.19 at 2:15 pm in the Ft. Union Room. Additionally, the Legislative Employee Benefits Programs Committee met on 1.15.19 and took jurisdiction over the bill. PERS is working with its actuary to determine the cost impact of the bill.

Legislative Links:

NDTFFR Website – 2019 Proposed Legislation

ND Legislative Branch Website – 66th (2019) Legislative Assembly

HB 1044

House Government and Veterans Affairs Committee
January 4, 2019

Fay Kopp, Chief Retirement Officer – ND Teachers' Fund for Retirement
Deputy Executive Director – ND Retirement and Investment Office

HB 1044 was submitted by the Teachers' Fund for Retirement (TFFR) Board. The bill includes specific statutory language which is required by federal tax law in order for TFFR to maintain its status as a qualified governmental pension plan. The bill generally clarifies existing statutory provisions to more accurately reflect actual operations of the TFFR.

On March 17, 2017, the IRS made a favorable determination on the NDTFFR plan on the condition that certain proposed amendments are adopted in the 2019 legislative session. HB 1044 contains these amendments and reflects specific language required by the IRS.

TFFR is currently operating in compliance with all IRS requirements, so there will be no change in administrative processes. Tax implications regarding refunds, lump sum payments, and certain death benefits are detailed in a Special Tax Notice which is provided to all members considering taking a distribution from TFFR.

HB 1044 does not make any benefit, contribution, or plan design changes. The changes do not have an actuarial impact on the plan, and are not being submitted for funding improvement purposes.

Section 1. NDCC 15-39.1-34. Internal Revenue Code compliance.

- Provides clarification and additional detail on direct rollover provisions that apply to the NDTFFR plan, namely the limitations on direct rollovers that apply to after-tax employee contributions, definitions for eligible rollover distributions, eligible retirement plan, and distributee.

TFFR's actuarial consultant, Segal, reviewed the bill draft and indicated it would have no actuarial cost impact. Since the IRS approved the language, the bill does not present any IRS compliance issues (Segal letter dated September 4, 2018).

The Legislative Employee Benefits Programs Committee gave HB 1044 a favorable recommendation. On behalf of the TFFR Board, I respectfully request that your Committee give the bill a "do pass" recommendation.

Thank you.

SEGAL

101 North Wacker Drive Suite 500 Chicago, IL 60606-1724
T 312.984.8500 F 312.984.8590 www.segalco.com

September 4, 2018

Via E-mail

Ms. Fay Kopp
NDRIO Deputy Executive Director / NDTFFR Chief Retirement Officer
ND Retirement & Investment Office | ND Teachers' Fund for Retirement
3442 East Century Avenue | P.O. Box 7100
Bismarck, ND 58505-7100

Re: **Technical Comments on Draft Bill 126 (IRS compliance changes)**

Dear Fay:

As requested, we reviewed draft Bill 126 (Bill No. 19.0126.01000), which proposes technical changes to the North Dakota Teachers' Fund for Retirement (TFFR) that are required to be made under the terms of the Fund's determination letter from the Internal Revenue Service (IRS) on the tax-qualified status of the plan. The following presents our analysis of such proposed changes found in draft Bill 126.

Summary: The proposed legislation adds new paragraph 2 to North Dakota Century Code §15-39.1-34, which describes the detailed rules for direct rollovers under Internal Revenue Code sections 401(a)(31) and 402. The language in this paragraph 2 was approved by the IRS as satisfying qualification rules for governmental pension plans under these sections of the Internal Revenue Code. The IRS provided the TFFR a favorable determination letter on the tax-qualified status of the plan, which is contingent upon adopting the approved language.

Actuarial Cost Analysis: This bill would have no actuarial cost impact on the TFFR.

Technical Comments: Our comments on the bill are as follows:

General Comments

The bill generally clarifies existing statutory provisions to more accurately reflect actual operations of the TFFR. The provisions of this bill do not appear to directly or significantly impact the benefits payable from the TFFR.

Compliance Issues

The bill amends North Dakota Century Code §15-39.1-34 by adding paragraph 2 to describe the direct rollover rules under the plan in a manner that complies with Internal Revenue Code section 401(a)(31). Since the IRS approved the language in paragraph 2 for this purpose, the bill does not present any compliance issues.

Administrative Issues

The language of the bill accurately reflects the actual operations of the rollover rules under the plan and helps the plan maintain compliance with applicable federal requirements for tax-qualified pension plans.

The information contained in this letter is provided within our role as the plan's actuary and benefits consultant and is not intended to provide tax or legal advice. We recommend that you address all issues described herein with your legal counsel.

Please contact us if you have any questions or comments.

Sincerely yours,

Kim Nicholl
Kim Nicholl, FSA, EA, FCA
Senior Vice President and Consulting Actuary

Melanie Walker
Melanie Walker, JD
Senior Vice President

cc: Matthew Strom

Bill Draft No. 20

Legislative Employee Benefits Programs Committee
October 25, 2018

Fay Kopp, Chief Retirement Officer – ND Teachers' Fund for Retirement
Deputy Executive Director – ND Retirement and Investment Office

Bill Draft No. 20 changes the powers and duties of the Legislative Employee Benefits Programs Committee. Legislators and legislative committees would no longer be required to submit proposed bills or amendments to the Committee for review to ensure an actuarial study is done, although executive and judicial branch entities would need to continue doing so.

According to TFFR's actuarial consultant, Segal, the bill itself does not have an actuarial cost impact. However, the bill could lead to a scenario that would have a significant impact on the financial health of TFFR and other ND retirement plans. Since no actuarial study would be required if this bill were passed, legislators or legislative committees might not identify the potential range and impact of the risk associated with bills or amendments. This could have significant actuarial cost impact on TFFR, affect the benefits payable from the retirement system which could adversely impact TFFR, or have administrative or IRS compliance implications. An actuarial study helps to identify and assess risks associated with proposed legislation. (Segal letter dated September 4, 2018).

While the TFFR Board has not yet taken a position on Bill Draft No. 20, the Board has expressed serious concerns about the bill due to its potential negative impact on the financial health of the TFFR plan.

Thank you.

Segal Consulting

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T 312.984.8500 www.segalco.com

September 4, 2018

Via E-mail

Ms. Fay Kopp
NDRIO Deputy Executive Director / NDTFFR Chief Retirement Officer
ND Retirement & Investment Office | ND Teachers' Fund for Retirement
3442 East Century Avenue | P.O. Box 7100
Bismarck, ND 58507-7100

Re: **Technical Comments on Draft Bill 20**

Dear Fay:

As requested, we reviewed draft Bill 20 (Bill No. 19.0020.01000), which proposes administrative changes relating to the powers and duties of the Legislative Employee Benefits Programs Committee. The following presents our analysis of such proposed changes found in draft Bill 20.

Summary: The proposed legislation updates North Dakota Century Code §54-35-02.4 such that legislators or legislative committees would no longer be required to submit a draft measure or proposed bills or amendments, affecting a public employees retirement program, public employees health insurance program, or public employee retiree insurance program, for review to ensure an actuarial study is done. However, the judicial and executive branch agency may not introduce a legislative measure unless the legislative measure is accompanied by a report.

Actuarial Cost Analysis: This bill, in and of itself, would have no actuarial cost impact on the TFFR.

Technical Comments: Our comments on the bill are as follows:

General Comments

While the bill itself does not have an actuarial cost impact, this bill could lead to a scenario that has a significant impact on the financial health of the TFFR and other North Dakota retirement systems.

Since no actuarial study would be required if this bill were passed, legislators or legislative committees might not identify the potential range and impact of the risks associated with amendments introduced by them. As a result, this could have significant actuarial cost impact on the TFFR, or affect the benefits payable from the retirement system. A seemingly innocuous draft bill may, in fact, have material or even significant cost or administrative implications. If not properly evaluated within the context of an actuarial analysis, proposed legislation could adversely impact TFFR.

In addition, an actuarial study would help to identify risks associated with the retirement system's future financial condition, and if those risks are anticipated to be significant, assess those risks. As part of a risk assessment, an actuarial study may include scenario testing, sensitivity testing, stress testing, and/or stochastic modeling. A more detailed actuarial study could help legislators or legislative committees to develop a better understanding of the risks associated to changes introduced by draft legislation.

The information contained in this letter is provided within our role as the plan's actuary and benefits consultant and is not intended to provide tax or legal advice. We recommend that you address all issues described herein with your legal counsel.

Please contact us if you have any questions or comments.

Sincerely yours,

Kim Nicholl

Kim M. Nicholl, FSA, EA, FCA
Senior Vice President & Actuary

cc: Matthew Strom

Senate Bill 2022

North Dakota Retirement and Investment Office (RIO)
Testimony to the Senate Appropriations Committee

David Hunter, Executive Director/CIO
Fay Kopp, Deputy Executive Director/CRO

January 8, 2019

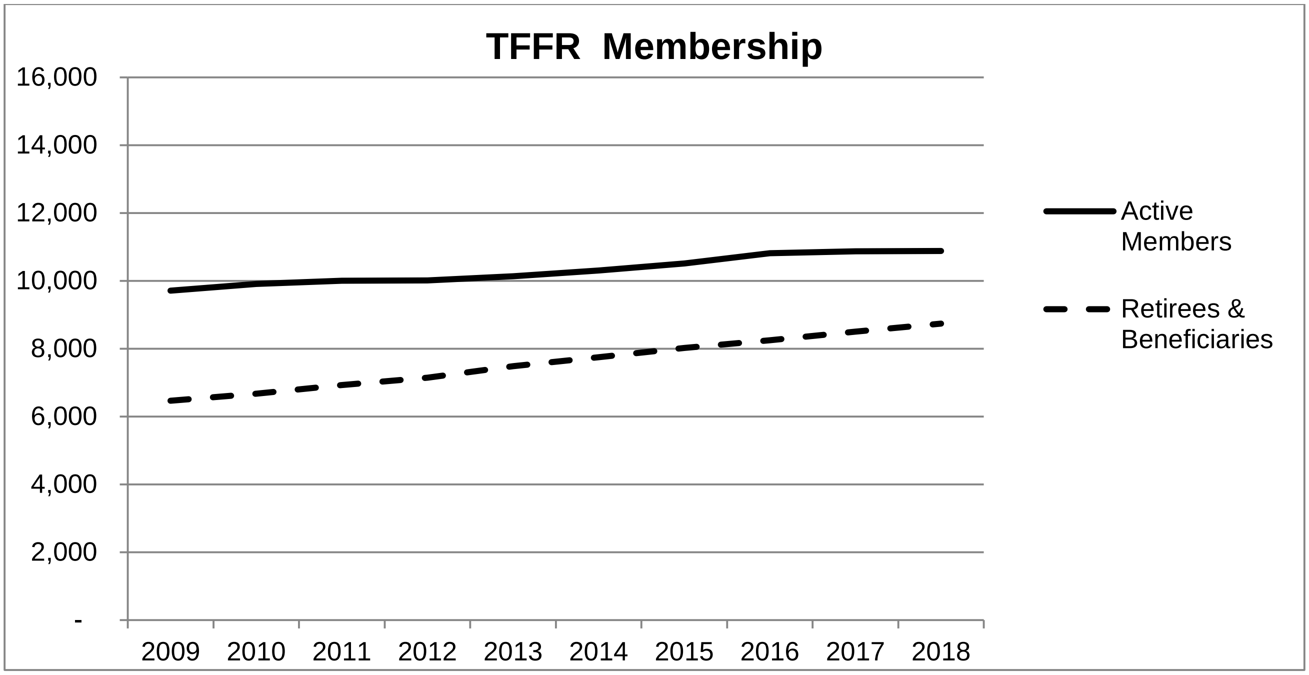
RIO Programs Overview

RIO was created by the 1989 Legislative Assembly to capture administrative and investment cost savings in the management of two important long-standing state programs – the retirement program of the Teachers' Fund for Retirement (TFFR) and the investment program of the State Investment Board (SIB). RIO is a Special Fund agency and receives no General Fund appropriation. All appropriated expenditures for the TFFR program are paid from contributions collected from members and employers and from invested assets/earnings. All appropriated expenditures for the SIB investment program are allocated directly to the client funds and paid out of their invested assets/earnings.

- **Teachers' Fund for Retirement (TFFR)**

TFFR is a qualified defined benefit public pension plan. The program is managed by a seven-member board of trustees which consists of the State Treasurer, State Superintendent, and five active and retired teachers and administrators appointed by the Governor.

The plan covers North Dakota public school teachers and administrators. Benefit funding comes from member and employer contributions and investment earnings. During the past decade, active membership has increased 12.1% from 9,700 to nearly 10,900 participants, while retirees and beneficiaries have increased 35.2% from less than 6,500 to over 8,700.



For Fiscal Year 2018 there were 214 participating TFFR employers comprised as follows:

School Districts	176
Special Ed Units	19
Vocational Centers	4
Counties	6
State Agencies/Institutions	5
Other	4
2017-18 Total Employers	**214**

The TFFR program appropriated expenses includes salaries, benefits and administrative overhead costs for the administration of the day-to-day operations of the fund and delivery of high quality services and outreach programs to members and employers. Examples of activities included in the administration of the TFFR program are detailed in the following table, based on the fiscal year ended June 30, 2018.

Activity	# of Members
Monthly collection of contributions from 214 Employers	10,881
Maintenance of Membership Records	22,218
New Retirement & Disability Claims Processed	401
Deaths Processed	226
Refunds/Rollovers Processed	228
Service Purchase Inquiries Processed	174
New Member Enrollments Processed	879
Monthly Benefit Payments Processed	8,743
Educational Outreach Programs Attended	1,047

Additional administrative activities include development of publications and educational materials for active and retired members and employers; maintenance of website, member and employer online services, and the pension administration software system that houses all TFFR member data; compliance reviews to verify accuracy of member records, contributions, and benefit payments; and staff training and education to ensure all necessary regulatory and financial reporting requirements are being met.

Benefit payments to retirees or their beneficiaries totaled $202.4 million in fiscal year 2018. Another $5.6 million was paid out in refunds of account values. These payments, in addition to amounts paid to actuarial, investment and other consultants, are included in a continuing appropriation under ND Century Code section 15-39.1-05.

- **State Investment Board (SIB)**

The SIB is responsible for the investment of over $13 billion in assets for seven pension funds and 18 other non-pension funds. The following table shows the most currently available fair value of assets by fund.

	Fair Value as of 11/30/18 (unaudited)
PENSION POOL PARTICIPANTS	
Teachers' Fund for Retirement	$2,420,114,305
Public Employees Retirement System	2,963,975,311
Bismarck City Employee Pension Fund	97,918,151
Bismarck City Police Pension Fund	39,552,163
City of Grand Forks Pension Fund	63,635,519
City of Grand Forks Park District Pension Fund	6,716,738
Subtotal Pension Pool Participants	5,591,912,187
INSURANCE POOL PARTICIPANTS	
Workforce Safety & Insurance Fund	1,883,403,124
State Fire and Tornado Fund	22,633,302
State Bonding Fund	3,419,780
Petroleum Tank Release Fund	6,186,592
Insurance Regulatory Trust Fund	1,206,840
State Risk Management Fund	4,553,198
State Risk Management Workers Comp	3,597,772
Cultural Endowment Fund	444,042
Budget Stabilization Fund	114,461,578
ND Association of Counties (NDACo) Fund	5,846,080
City of Bismarck Deferred Sick Leave	721,786
PERS Group Insurance	32,329,024
State Board of Medicine	2,247,701
City of Fargo FargoDome Permanent Fund	42,594,784
Lewis & Clark Interpretive Center Endowment	692,611
Subtotal Insurance Pool Participants	2,124,338,214
INDIVIDUAL INVESTMENT ACCOUNTS	
Legacy Fund	5,765,157,670
Retiree Health Insurance Credit Fund	124,450,806
Job Service of North Dakota Pension Fund	95,280,203
Tobacco Prevention and Control Trust Fund	48,578,910
TOTAL	$13,749,717,990

The 11-member State Investment Board includes the Lt. Governor, State Treasurer, State Insurance Commissioner, State Land Commissioner, Workforce Safety & Insurance designee, three PERS board members, and three TFFR board members. All the funds are invested in accordance with the “Prudent Investor Rule”.

Investment guidelines and asset allocations are determined by the governing bodies of the individual funds (with assistance from consultants and/or RIO staff) and then turned over to the SIB for implementation. The SIB selects investment managers to manage different types of portfolios within each asset class with the goal of maximizing return within the clients’ acceptable risk levels. Similar client funds are pooled together when possible to achieve efficiencies in staff monitoring and to receive lower fees from investment managers.

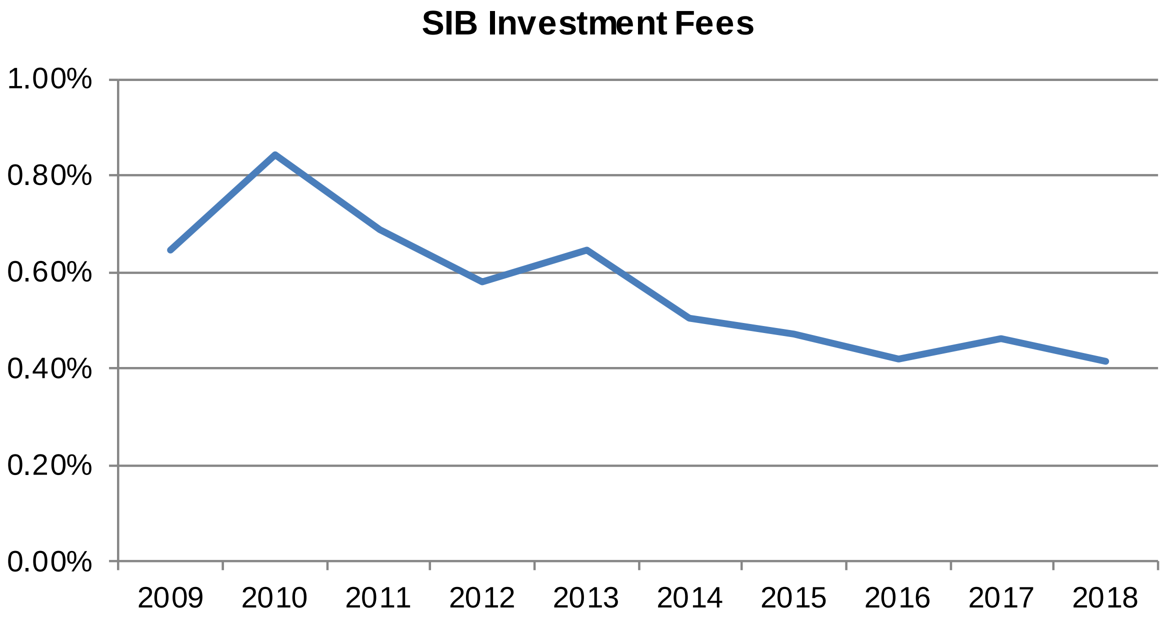
The SIB investment program appropriated expenses include salaries, benefits and administrative overhead for the management of the day-to-day operations of the program.

The staff of RIO administers the day-to-day operations of the investment program by assisting client funds with asset/liability studies; conducting investment manager searches; monitoring guidelines and asset allocations of each client fund; managing the consultant, custodian and investment manager relationships; conducting initial and continuing due diligence on the investment managers; researching new investment and risk management options; and maintaining separate monthly accounting and investment performance data for all 25 client funds. Statistics regarding the number of investment clients/managers/accounts, etc., are shown in the following table.

Client Funds	25
Asset Class Pools/Groups	34
Investment Manager Relationships	38
Investment Strategies	75
Investment Manager Accounts	113
Custodian Banks	2
Investment Consultants	3

The SIB has continuing appropriation authority under ND Century Code section 21-10-06.2 to pay for investment related costs of the program such as investment management fees, custodial fees, performance measurement fees, and fees associated with manager searches and onsite reviews of investment managers. These costs are allocated directly to the client funds affected by the expense and paid out of invested assets/earnings.

During the past 5 years, the SIB and RIO have re-intensified efforts to improve our overall return on investment management fees and expenses. As a result, SIB client investment fees have declined from 0.65% in fiscal 2013 to 0.42% in fiscal 2018. This 0.23% decrease in fees on $10 billion in assets equates to an annual savings of approximately $23 million. The following chart shows the downward trend in investment fees over most of the last decade.



Goals for SIB Client Investment Fees and Expenses:

The SIB and RIO work to keep investment fees and expenses at or below 0.50% per year, while seeking to identify investment firms which beat their performance benchmarks by 0.50% or more (after all fees and expenses) over the long-term. If we are successful in attaining both of the above goals, our SIB clients are effectively earning a minimum 2-for-1 return on our investment fee and expense dollars. The following chart offers an example for the Legacy Fund:

	FY 2018			FY 2017		
	Average Market Value	Fees in $	Fees in %	Average Market Value	Fees in $	Fees in %
Investment Fees	2 **5,291,348,530**	**15,909,882**	**0.30%**	**4,344,421,122**	**13,986,877**	**0.32%**
Investment Fees & Expenses	1	**16,635,287**	**0.31%**		**14,564,731**	**0.34%**
Actual Performance (Net of Fees)			**7.57%**			**12.03%**
Policy Benchmark			**6.51%**			**9.91%**
		Outperformance 3	**1.06%**		**Outperformance**	**2.12%**

Investment fees and expenses declined to 0.31% in fiscal 2018 from 0.34% in fiscal 2017, while noting the use of active management paid significant returns for the Legacy Fund in Fiscal 2018 as the **SIB paid 1 $16.6 million in fees to outperform the Policy Benchmarks by 3 1% or $50 million (2 $5 billion x 3 1% = $50 million).**

SIB client investments have grown from $6 billion in 2012 to over $13 billion in 2018.

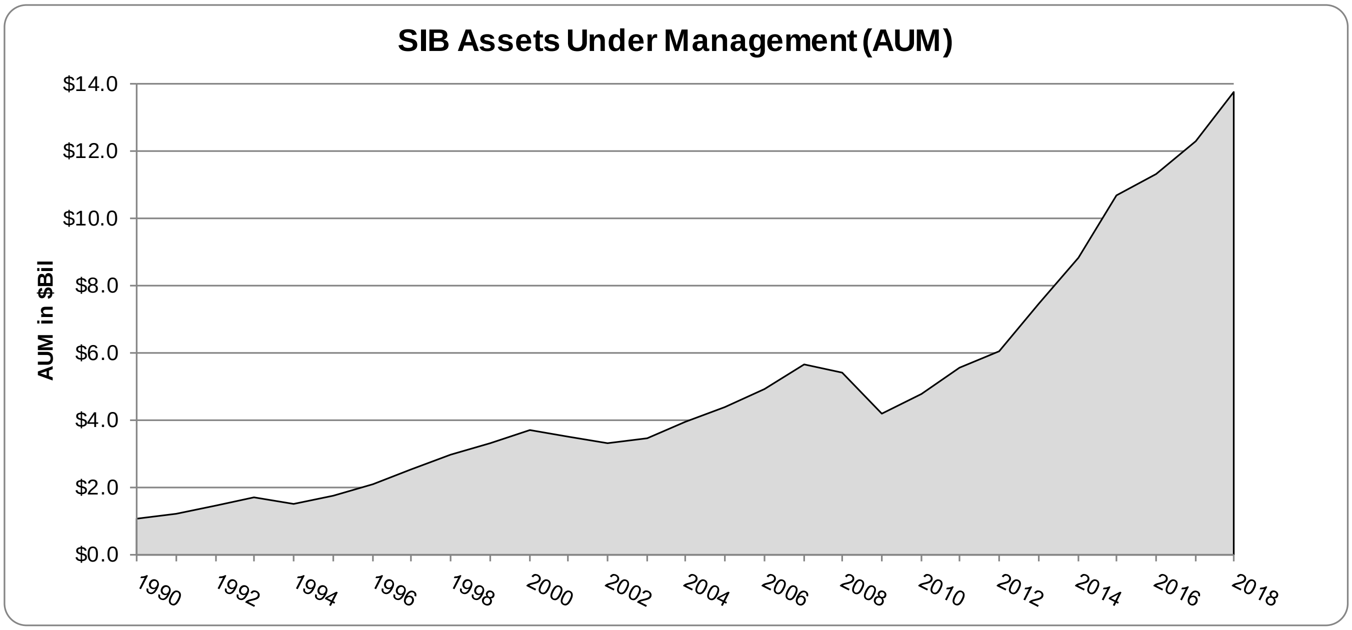


EXHIBIT A

RETIREMENT AND INVESTMENT OFFICE 190
2019-2021 BIENNIUM BUDGET REQUEST

	1	2	3	4	5	6	7	8
	2017-19 Base Budget	2019-21 Base Budget Request (w/10% reduction)	Optional Adjustment #1 "Reinstate 10% Reduction"	Optional Adjustment #2 "Additional FTE"	Additional Governor's Recommendations	Total Governor's Recommendation	Optional Adjustment #3 One-time Request "Pension Admin. System Project"	Total Agency Request
Salaries & Wages	$ 4,425,570	$ 3,860,125	$ 550,194	$ 294,996	$ 304,981	$ 5,010,296	$ 50,000	$ 5,060,296
Operating Expenses	862,484	862,484	-	14,450	12,000	888,934	2,789,000	3,677,934
Contingency	52,000	82,000	-	-	-	82,000	-	82,000
Capital Assets	-	-	-	-	-	-	6,300,000	6,300,000
	$ 5,340,054	$ 4,804,609	$ 550,194	$ 309,446	$ 316,981	$ 5,981,230	$ 9,139,000	$ 15,120,230
FTE Count	19	16	3	1	-	20	-	20

10% Base Budget Reductions:
In order to meet the requirement of a 10% cut in the base budget request, RIO chose to submit the reduction to the salaries and wages line. Due to a drastic 13% reduction to the operating line for the 2017-19 biennium, it was difficult to find any additional savings in that line. In addition to that, the 10% overall reduction, if taken from the operating line, would equate to a 62% cut to the operating line. No specific positions were indicated for elimination as part of the original base budget request. Over a dozen combinations of position cuts and salary reductions were considered and most scenarios required a minimum of three positions to be eliminated to reach the 10%. Any reduction to RIO’s current workforce will severely compromise the agency’s ability to maintain ongoing TFFR pension administration operations and SIB investment management functions.

Optional Adjustment #1 - Reinstate 10% Base Budget Reductions:
The Governor included Optional Adjustment #1 in his recommendation.

Optional Adjustment #2 - Additional FTE for Investment Program:
This request is for an additional FTE for the SIB investment program and additional operating expenses related to that position.

As an industry best practice, RIO is currently developing a more robust investment risk management oversight and reporting function within the SIB investment program. Investment risk management is the process of identifying the level of risk that an entity wants, measuring the level of risk that an entity currently has, taking actions that bring the actual level of risk to the desired level, and monitoring the new actual level of risk so that it continues to be aligned with the desired level of risk. The process is continuous and developing an effective framework requires measuring, monitoring, and managing exposure to both economic and fundamental drivers of risk and return across asset classes to avoid over-exposures to common risk factors. Additionally, the SIB's current strategic plan includes "enhancing our internal control environment by improving the use of proven risk management solutions" noting that "a robust risk management framework serves as the foundation to support a sound internal control environment and lessen downside risk."

The SIB investment program has grown tremendously over the last six years, with client assets increasing 122% or $7.4 billion, while staffing has remained consistent at 6.95 FTEs. Investment performance and client satisfaction have been strong, with returns in the top quartile of peer universes over the past 15 years. However, RIO recognizes that our ability to continue achieving positive results and reaching the goal of additional risk monitoring or any other enhancements to client services will be highly challenged without the additional FTE. The Governor recognized the importance of this request and has included the additional FTE in his recommendation.

Optional Adjustment #3 - TFFR Pension Administration System Project: Details regarding the methodologies used to determine the probable costs for this project are included within the testimony. This one-time project request was not included in the Governor's recommendation.

2017-19 Budget Status

As shown in Exhibit A, Column 1, the RIO 2017-19 approved budget is just over $5.3 million. Salaries and wages for RIO's current 19 FTEs make up nearly 83% of that total. After having three vacancies early in the biennium, RIO is now fully staffed. It is anticipated that we will have approximately $81,000 left in this line item at the end of the biennium due to those vacancies.

Operating expenses were approved at just over $862,000 for the 2017-19 biennium. This was a 13% decrease from the previous biennium's approved operating expenses. Due to this sharp decrease, staff brainstormed ideas for cost savings across the agency. The first area that was explored was travel and professional development. Staff and board members were asked to limit their requests for out-of-state conferences and other educational opportunities to one for the biennium. Most chose to forego training in the first year of the biennium to ensure funding would be available. During this time, other longer-term cost-savings options were explored to guarantee that funds would be available for highly important education opportunities going forward.

The largest long-term cost saving idea that has been implemented relates to the printing and mailing of newsletters and other similar materials to active members of the TFFR retirement program. It was determined that TFFR employers can be utilized to assist in disseminating this information to active members through the use of emails and the RIO website. It is anticipated that RIO can save over $20,000 per biennium due to this process change.

Staff has been very frugal, not only during this biennium but historically, when requesting the expenditure of operating funds. Because of the limitations imposed on educational opportunities as well as the savings in postage and printing, RIO expects to have a balance of approximately $23,000 in the operating line at the end of the current biennium.

The contingency line item was also reduced in the 2017-19 biennium. The $30,000 reduction amounted to a 37% reduction. This line item is reserved for expenses that are outside of normal operations and are difficult to plan. In the past, this line item has been used for executive search firms to assist in filling the Executive Director/CIO position. Due to the nature of these types of expenses, the costs can be high. The average expenditures from this line in the past have been in the $75,000-$100,000 range, therefore making the reduction to this line concerning. We have not had the need to spend anything from this line during the 2017-19 biennium-to-date.

	2017-19 Approved Appropriation	Actual Expenses through 12/31/18	Estimated Remaining Expenses	Estimated Total 2017-19 Expenses	Estimated 2017-19 Ending Appropriation Balance
Salaries & Wages	$ 4,425,570	3,233,570	1,111,000	4,344,570	81,000
Operating Expenses	862,484	457,648	382,124	839,772	22,712
Contingency	52,000	-	-	-	52,000
	$ 5,340,054	3,691,218	1,493,124	5,184,342	155,712

2019-21 Budget Request

Base Budget Request

As detailed in Exhibit A, Column 2, RIO submitted a base budget request with a 10% reduction from the 2017-19 biennium. In order to meet this requirement, RIO chose to submit the reduction to the salaries and wages line. Due to the drastic 13% reduction to the operating line for the 2017-19 biennium, it was difficult to find any additional savings in that line. In addition to that, the 10% overall reduction, if taken from the operating line, would equate to a 62% cut to the $862,000 operating line. No specific positions were indicated for elimination as part of the original base budget request. Over a dozen combinations of position cuts and salary reductions were considered and most scenarios required a minimum of three positions to be eliminated to reach the 10%. Any reduction to RIO's current workforce will severely compromise the agency's ability to maintain ongoing TFFR pension administration operations and SIB investment management functions.

With some minor adjustments between categories within the operating line, the base budget operating line request was submitted at "hold-even". Savings identified within the postage and printing categories were deployed back into travel and professional development to ensure staff and board members are sufficiently educated on current topics in the public pension and investment communities to properly fulfill their fiduciary duties to the funds they represent.

The $30,000 reduction in the contingency line for the 2017-19 biennium was added back in the base budget request to ensure adequate funds are available based on historical averages.

Optional adjustments included in Governor's recommendation (Exhibit A, Columns 3 & 4)

RIO included three optional adjustment packages in the original budget request, two of which were included in the Governor's recommendation.

Optional Adjustment #1 – Reinstate 10% Reduction *(included in Governor's recommendation)*: As mentioned earlier, the 10% reduction to the base budget was submitted within the salaries and wages line. Because the salaries and wages line is over 80% of RIO's total budget, it was difficult to reach the 10% outside of that area. Many scenarios were explored in attempting to identify positions that could be eliminated but the result was that in nearly all scenarios, a minimum of three positions would need to be eliminated to meet the 10% threshold. The Governor agreed that a reduction of over 15% (3+ FTEs) of RIO's current workforce would severely compromise the agency's ability to maintain ongoing TFFR pension administration operations and SIB investment management functions and therefore included this optional adjustment in his recommendation.

Optional Adjustment #2 – Additional FTE for Investment Program *(included in Governor's recommendation.)*: As an industry best practice, RIO is currently developing a more robust investment risk management oversight and reporting function within the SIB investment program. Investment risk management is the process of identifying the level of risk that an entity wants, measuring the level of risk that an entity currently has, taking actions that bring the actual level of risk to the desired level, and monitoring the new actual level of risk so that it continues to be aligned with the desired level of risk. The process is continuous and developing an effective framework requires measuring, monitoring, and managing exposure to both economic and fundamental drivers of risk and return across asset classes to avoid over-exposures to common risk factors.

The SIB's current strategic plan includes "enhancing our internal control environment by improving the use of proven risk management solutions" noting that "a robust risk management framework serves as the foundation to support a sound internal control environment and lessen downside risk."

Following an extensive review of leading investment risk management system vendors, RIO selected a solution in 2016 to implement a risk management system across the investment program. The state of the art multi-asset class risk management solution combines sophisticated risk analytics and subject matter expertise to help RIO better understand and manage risk, resulting in more informed investment decisions using the system's tools for portfolio risk, stress testing and scenario analysis; asset allocation analysis; performance and attribution; and compliance and oversight.

RIO continues to work with the vendor to develop a risk dashboard for monitoring downside risk under various historical and hypothetical stress scenarios. Additionally, RIO intends to enhance its investment risk monitoring reports to include an expanded list of key risk metrics. However, current staffing within the investment program is seriously limiting the amount of time available to make these enhancements.

This request is for an additional FTE for the SIB investment program and additional operating expenses related to that position.

Significant highlights in the SIB investment program include the following; however, RIO recognizes that our ability to continue achieving these results and reaching the goal of additional risk monitoring or any other enhancements to client services will be highly challenged without the additional FTE.

- SIB client investments have increased by $7.4 billion or 122% in the past six years while the authorized FTEs assigned to the investment program have remained steady at 6.95.
- Investment returns for the Pension Trust (including PERS and TFFR) improved from the 74th percentile for the last 10-years to the 26th percentile the last 5-years and 23rd percentile for the 3-years ended 6/30/2018.
- Legacy Fund investment earnings are nearly $1 billion since inception including $200 million for the 16 months ended October 31, 2018. NDCC earnings (transferrable to the General Fund) were $285 million as of October 31.
- Customer satisfaction surveys have remained strong (averaging 3.6 on a 4.0 scale)

Other Adjustments (Exhibit A, Column 5)

The Governor’s recommendation also includes adjustments to RIO’s base budget request in the salaries and wages line in the amount of $304,981 which includes his recommendations for state employee salary increases as well as changes to benefit amounts for insurance and PERS retirement contributions.

Also, after the agency budget submission deadline, ITD contacted agencies regarding the state-wide implementation of Microsoft Office 365. Because we did not have any costs in our base request for Microsoft Office upgrades or replacements (we upgraded in a previous biennium), we were required to calculate the additional cost to the agency to move to Office 365. That cost was $12,000 for the 2019-21 biennium and was included in operating expenses in the Governor’s recommendation.

Optional adjustment not included in Governor’s recommendation (Exhibit A, Column 7)

Optional Adjustment #3 – Pension Administration System Project (One-time Request): RIO is requesting an amendment to SB 2022 which would provide for one-time spending of up to $9.139 million (or only as much as is necessary) of TFFR trust funds to upgrade or replace TFFR’s outdated pension administration computer system.

TFFR Pension Administration Software Modernization Study

TFFR's current pension administration software (PAS) has been in operation for over 13 years. The functionality and technical architecture of this client-server technology is now at the end of its product release lifecycle and needs to be updated.

The TFFR Board and RIO staff believes it is a necessary and prudent use of TFFR funds (special fund, not general fund) to upgrade or replace the current system with a more technologically advanced, web based system which would provide significant improvements in functionality, efficiency and system security for TFFR members, employers, and staff. An updated system is needed in order for TFFR to re-engineer business processes and automate TFFR pension administration activities, reporting capabilities, electronic communications and services. The current PAS has many limitations, and without an updated PAS, TFFR will need to spend trust fund assets trying to maintain an old system, instead of investing in newer technology that includes the necessary functionality to efficiently administer the plan.

During the past year, RIO has studied the potential risks, benefits, and costs of upgrading or replacing the current PAS. We have worked with State ITD, State Procurement, PERS, and a nationwide pension software consulting firm on this study.

Risks of Current PAS:

- Functionality and technical architecture of current PAS is outdated. Continuing to utilize the current PAS does not allow RIO to take advantage of advancing technology and security improvements. Current PAS administrator interface is deployed as a client-server application which has significant limitations. For example, TFFR's current software is a 32-bit application. Most operating systems are now based on 64-bit technology platforms.
- Cost to maintain current PAS is expected to increase. While the current vendor provides limited support for the PAS product, the number of personnel familiar with the older version technical environment and TFFR customizations will diminish, resulting in a higher cost for support services as time progresses. Additionally, the older the system gets, the greater the likelihood for the system to crash and need costly fixes in order to continue operating. (See Concerns if Project is Not Approved.)
- Current Member self-service portal is very limited and provides basic "read only" functionality. It does not allow for any electronic member communication and interaction. While it can be customized to add new features (at a significant cost), the portal presentation will retain the present look and feel. The current self-service user interface uses frames technology which has limitations and is not fully ADA compliant.
- Current Employer self-service portal is also very limited and provides only basic functionality. Again, it does not allow for any electronic employer communication and interaction. Employers cannot perform any business rule validations of the member data contained in the file. RIO staff must perform the validations, evaluate any data exceptions and any action for any data corrections that are to be addressed and resubmitted by the employer, which is time consuming and inefficient.

Benefits of Updated PAS (Upgrade or Replacement):

- Most of the features needed to reinvent the way TFFR conducts its business operations are standard functions of a modern PAS.
- Updated PAS will enable TFFR to adopt best practices in self services for members and employers, achieve greater efficiencies in daily administration, and provide security improvements that are available with new technology vs old technology.
- Updated Employer self-service would allow employers to securely communicate with TFFR, and take greater ownership of their data. Employers would have the ability to securely upload contribution data, receive immediate validation results, confirm contribution remittances, and view their remittance histories and receivable accounts.

- Updated Member self-service would allow members to securely communicate with TFFR, access and update certain personal information, and run their own benefit estimates.
- Updated PAS would allow for straight-through-processing to automate enrollment, termination, retirement request processing, benefit calculations, e-communications, e-forms, and e-distribution to members and employers.
- Communications would be timelier with members and employers being able to initiate requests online and receive statements, notifications, and correspondence securely through the web portal from anywhere and at any time using a desktop computer or mobile device.
- Digital (electronic) communication is direct and secure, saves on mailing costs, and reduces reliance on paper which is a cost savings to the fund.
- An updated PAS would provide future ability to deploy the application to either a private or public cloud environment.

Additional benefits include:

- Web-based interface for administrators via commonly used and supported web browsers
- Enhanced web self-services for members, retirees, employers, and other stakeholders
- Benefit estimates and retirement modelling tools with member self-service
- Responsive web design for access with tablets and smartphones – mobile access
- Business process workflow
- Case and task management
- Email notification
- Administrator dashboards
- Employer self-service payroll contribution reporting, real-time data validation, and view access to receivable accounts
- Expanded accounting functionality to capture financial transactions, map to and export data to the general ledger system
- Integrated document imaging with bar-coding capability for process automation
- Online ad-hoc queries and reports
- Seminar scheduling
- Application management tools

Based on the anticipated benefits listed above, RIO believes there is an opportunity for post implementation efficiencies that could result in future budget reductions in the TFFR pension program. Potential budget reductions are not quantifiable at this point in the project planning. However, if TFFR is able to automate current pension administration processes with a new system and transition to secure digital communications with members and employers, at a minimum, it is expected to save printing and mailing costs and allow users to better utilize their skills and knowledge in other needed areas of retirement program administration.

In order to successfully complete the project within the anticipated project timeline (2-3 years), it will be necessary to maintain all current budget and staffing levels in order to re-engineer business processes and maintain adequate service levels during the implementation.

Cost to Upgrade or Replace Current PAS:

In order to estimate the cost to upgrade or replace the current PAS, RIO reviewed market value research conducted by a nationwide IT consulting firm specifically focused on addressing the operational and technological challenges of retirement benefits administration organizations. Two approaches were used in developing the budget estimate for this project. In these analyses, key parameters such as plan members, employers, users, and market value of assets were matched against a large database of other state and local pension systems, and averaged to those that are similar to TFFR to determine an estimate. Additionally, RIO staff worked with state ITD in project planning and identifying other potential costs for this project.

The $9.139 million estimated project cost includes budget estimates for:

- External vendor costs for software licensure, implementation, deployment, and post implementation maintenance and support.
- External consulting costs including procurement assistance, project management, oversight support, quality assurance, and business process improvement and reengineering.
- Internal consulting costs for ITD project management, ITD oversite, AGO legal fees, temporary salaries, and other project costs and contingencies.

It is important to note that **IF** a **system upgrade** by TFFR's current pension software vendor is selected, the cost could be much less than the $9.139 million project cost estimate for a **system replacement** by a different vendor. Upgrades by a current vendor to a newer software version typically cost less, have a shorter timeline, require less staff training, and carry less risk than a complete system replacement utilizing a new vendor. (See Vendor Selection and Project Oversight.)

With over 22,200 active, inactive, and retired members, a $9.139 million one-time cost is approximately $411 per member, or spread over 10 years (expected software life), about $41 per member. If the project costs less, for example $6 million, it would be about $270 per member, or about $27 per member over 10 years. Based on June 30, 2018 TFFR market value of $2.53 billion, a $9.139 million cost is approximately 0.36% (36/100 of 1%). A $6 million cost is about 0.24% (24/100 of 1%).

As part of our study, RIO staff also received a demo of the current web-based PERS pension administration software which utilizes a different vendor than TFFR. Through our discussions with PERS, we determined that while TFFR and PERS perform some similar pension administration functions, TFFR and PERS members are different, and most employers are different. Additionally, TFFR and PERS pension programs are administered by two separate agencies, so processes and procedures require different customizations and implementations. Even if the same vendor was utilized by both TFFR and PERS, each system requires different structures, configuration, and deployment. The RFP selection process will identify if any cost savings could be achieved by utilizing the same pension software vendor for both TFFR and PERS. Regardless, discussions with PERS regarding their pension software, implementation project, and costs have been very helpful, and we appreciate their willingness to share information.

Vendor Selection and Project Oversight

If the Legislature approves this one-time spending for the TFFR pension system upgrade or replacement project, RIO will follow all state statutes and ITD guidelines for a major IT project. RIO will work with state ITD and state Procurement in the consultant and vendor selection process. As required by state law, RIO will utilize the state's procurement process to select a consultant and a software vendor for the project to ensure a fair and competitive bidding process. RIO's current pension software vendor, and many other pension software vendors (including PERS' vendor) will be invited to submit formal proposals which will be closely scrutinized to determine the best long term solution for the best price for this important IT project. The TFFR Board must give final approval to hire both the project consultant and software vendor.

Project planning, management and oversight will be provided by state ITD. Project start up, status, and close out reports will be provided to ITD, SITAC, Legislative IT Committee, TFFR Board, and other interested stakeholders. As fiduciaries of the TFFR fund, the TFFR Board will closely monitor this project to ensure trust fund assets are being appropriately spent.

Concerns if Project Is Not Approved

If this project is not approved, RIO will need to continue operating the current PAS which utilizes outdated technology. Due to the high cost (and inability in some cases) of making technical improvements, RIO would be unable to re-engineer business processes and modernize operations, and would have to rely on an older system with less automation and less security. We would be unable to utilize secure digital communications with members and employers through online services.

Therefore, if the current PAS is not upgraded or replaced, RIO is subject to limited technical support, limited functionality, increased costs, increased security risks, and the potential for the current PAS to crash and not be fixed in a timely manner. This would cause many issues with daily pension administration functions (including monthly payroll to nearly 9,000 retired members). We have already had to make some costly fixes to the current software, and this is expected to increase as the software continues to age. We expect that RIO will incur increased costs to maintain and support the current PAS. Consequently, RIO may need to request an increase in the current IT line of RIO's budget contained in SB 2022 if this project is not approved.

Project Summary

While a TFFR pension administration software modernization project will be costly and time consuming, we believe it is in TFFR's best interests to make this investment now to take advantage of technology improvements and security enhancements that have been made in the years since the current software was implemented. This will allow RIO to reinvent the way it conducts business by providing significant functionality, customer service, and security improvements for over 20,000 active and retired members, 214 school districts and other participating employers, and RIO staff administering the TFFR plan.

Exhibit B (attached) provides a one-page summary of this project request. Our focus is on what is the best and most cost efficient use of TFFR trust funds. These are all special fund dollars – no general funds are being requested.

CONCLUSION – REQUEST FOR AMENDMENT

Based on the information provided within this testimony, RIO respectfully requests the following amendments to SB2022.

	2017-19 Base Level Appropriation	Adjustment to Base	Additional FTE	Additional Governor's Recommendations	One-time Request Pension Admin. System Project	Total Senate Amendment Request	Total Request from Senate
Salaries & Wages	$ 4,425,570	(15,251)	294,996	304,981	50,000	634,726	5,060,296
Operating Expenses	862,484	-	14,450	12,000	2,789,000	2,815,450	3,677,934
Contingency	52,000	30,000	-	-	-	30,000	82,000
Capital Assets	-	-	-	-	6,300,000	6,300,000	6,300,000
	$ 5,340,054	14,749	309,446	316,981	9,139,000	9,780,176	15,120,230
FTE Count	19	-	1	-	-	1	20

EXHIBIT B

SB 2022 – RIO Budget
TFFR Pension Administration Software (PAS) Modernization Project Summary

Request

- Upgrade or replace TFFR pension software with web-based system
- RIO conducted study involving ITD, Procurement, PERS, and Consultant

Risks of Current PAS

- Current system is 13-years old
- Functionality and technical architecture of client-server system is outdated
- Increased costs to maintain and support
- Limited technical support
- Limited functionality of member and employer online portals – read only
- No electronic member communication and interaction
- Inability to automate manual processes and re-engineer business processes
- Inability to utilize secure digital communications w/members and employers

Benefits of PAS Upgrade or Replacement

- Web based technology is standard
- Re-engineer business processes and adopt best practices in pension administration
- Enhanced member and employer self-service and security improvements
- Straight-through-processing to automate enrollment, termination, retirement processing, calculations, communications, forms, and distribution
- Cost savings with digital communication, and reduced paper mailings
- Improved staff efficiency

Estimated Cost

- $9.139 million (or less) one- time
- Cost could be less for system upgrade rather than system replacement by a different vendor
- Includes external vendor costs, consulting costs, project management, and ITD, legal, and other project costs and contingencies
- Special funds – no general funds

Vendor Selection and Project Oversight

- Utilize state's procurement/RFP process to select consultant and software vendor
- Follow ITD requirements in managing major IT project
- Required reports to ITD, SITAC, Leg IT Com.
- TFFR Board contract approval and project oversight to ensure TFFR trust fund assets are being appropriately spent

Summary

- Investment in updated technology will provide necessary tools to reinvent and automate TFFR retirement program operations and processes
- Updated technology will improve functionality, customer service, efficiency, and security for TFFR members, employers, and staff

TFFR Investment Update

For the Periods Ended September 30, 2018

January 14, 2019

Note: This document contains unaudited data which is deemed to be materially accurate, but is unaudited and subject to change.

Dave Hunter, Executive Director/CIO
Darren Schulz, Deputy Chief Investment Officer
Connie Flanagan, Fiscal and Investment Operations Manager
Eric Chin, Senior Investment Officer
ND Retirement & Investment Office (RIO)
State Investment Board (SIB)

TFFR Investment Ends – September 30, 2018

SIB clients should receive investment returns consistent with their written investment policies and market variables. This "End" is evaluated based on comparison of each client's (a) actual net investment return, (b) standard deviation and (c) risk adjusted excess return, to the client's policy benchmark over 5 years.

	1 Yr Ended 9/30/2018	3 Yrs Ended 9/30/2018	5 Yrs Ended 9/30/2018	Risk 5 Yrs Ended 9/30/2018	Risk Adj Excess Return 5 Yrs Ended 9/30/2018
Total Fund Return - Net	7.70%	10.03%	7.80%	4.62%	0.17%
Policy Benchmark Return	7.58%	9.28%	7.00%	4.22%	
Excess Return	0.12%	0.76%	0.80%	109%	

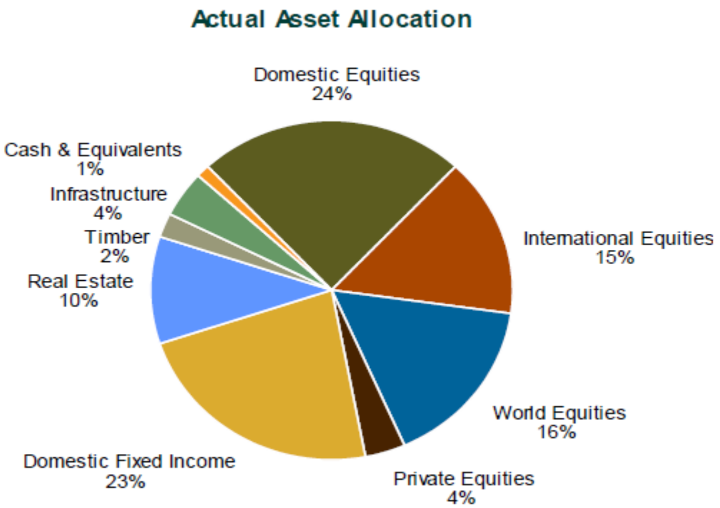
Key Point: TFFR investments have averaged nearly **$2.2 billion** during the last 5-years and Excess Return has averaged over **0.50%** per annum. Based on these values, **TFFR's use of active management has enhanced Net Investment Returns by $55 million for the 5-years ended Sep. 30, 2018** (or $2.2 billion x 0.50% = $11 million x 5 years = $55 million). This Excess Return has been achieved while adhering to prescribed **Risk** limits (e.g. **109%** versus a policy limit of 115%).

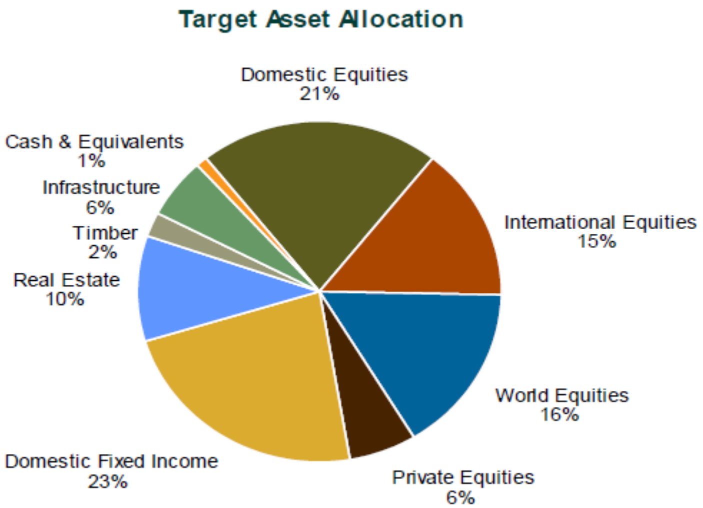
Current Policy Benchmark: 58% Equity (31% U.S., 21% Non-U.S., 6% Private); **23% Fixed Income** (16% U.S., 7% High Yield); **18% Real Assets** (10% Real Estate; 5.7% Infrastructure; 2.3% Timber); and **1% Cash.**

TFFR Allocation

As of September 30, 2018

TFFR's Actual Asset Allocations are within 3% of Target noting the Private Equity Underweight of 2.4% is offset by an Overweight allocation to Domestic Equity of 2.6%.


Actual Asset Allocation

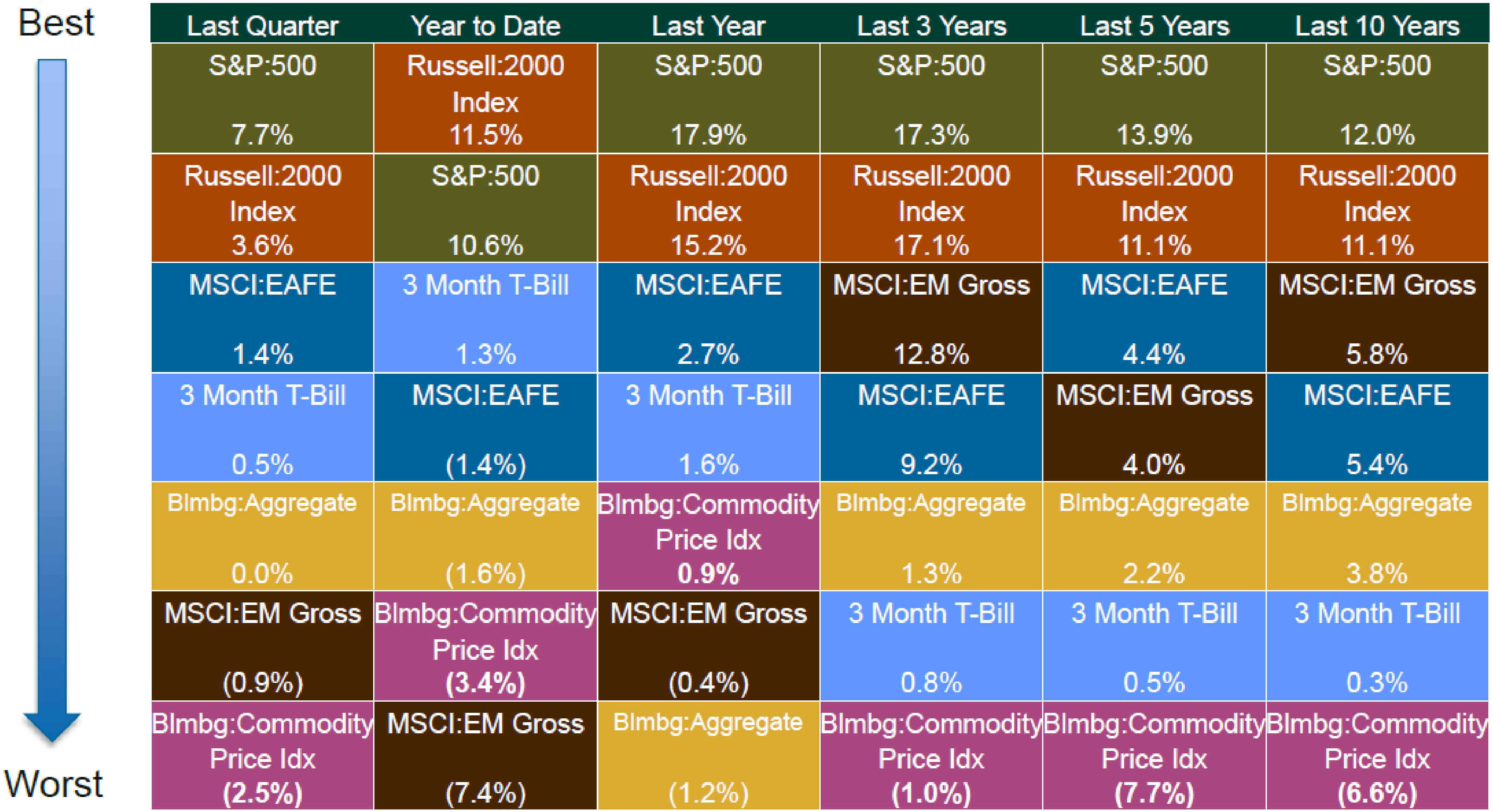

Target Asset Allocation

Asset Class	$000s Actual	Weight Actual	Target	Percent Difference	$000s Difference
Domestic Equities	605,837	24.0%	21.4%	2.6%	65,176
International Equities	383,128	15.2%	14.6%	0.6%	14,266
World Equities	408,955	16.2%	16.0%	0.2%	4,722
Private Equities	90,989	3.6%	6.0%	(2.4%)	(60,599)
Domestic Fixed Income	578,714	22.9%	23.0%	(0.1%)	(2,370)
Real Estate	258,706	10.2%	10.0%	0.2%	6,061
Timber	57,546	2.3%	2.3%	(0.0%)	(563)
Infrastructure	112,227	4.4%	5.7%	(1.3%)	(31,781)
Cash & Equivalents	30,352	1.2%	1.0%	0.2%	5,087
Total	2,526,453	100.0%	100.0%		

- Combined public equity allocations are above target. These "temporary" over-weights are reasonable from a risk-management perspective given that SIB awaits capital calls to fund private equity and infrastructure.

Periodic Table of Investment Returns for Periods Ended September 30, 2018

Asset Class Performance


Best

Worst

Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
S&P:500 7.7%	Russell:2000 Index 11.5%	S&P:500 17.9%	S&P:500 17.3%	S&P:500 13.9%	S&P:500 12.0%
Russell:2000 Index 3.6%	S&P:500 10.6%	Russell:2000 Index 15.2%	Russell:2000 Index 17.1%	Russell:2000 Index 11.1%	Russell:2000 Index 11.1%
MSCI:EAFE 1.4%	3 Month T-Bill 1.3%	MSCI:EAFE 2.7%	MSCI:EM Gross 12.8%	MSCI:EAFE 4.4%	MSCI:EM Gross 5.8%
3 Month T-Bill 0.5%	MSCI:EAFE (1.4%)	3 Month T-Bill 1.6%	MSCI:EAFE 9.2%	MSCI:EM Gross 4.0%	MSCI:EAFE 5.4%
Blmbg:Aggregate 0.0%	Blmbg:Aggregate (1.6%)	Blmbg:Commodity Price Idx **0.9%**	Blmbg:Aggregate 1.3%	Blmbg:Aggregate 2.2%	Blmbg:Aggregate 3.8%
MSCI:EM Gross (0.9%)	Blmbg:Commodity Price Idx **(3.4%)**	MSCI:EM Gross (0.4%)	3 Month T-Bill 0.8%	3 Month T-Bill 0.5%	3 Month T-Bill 0.3%
Blmbg:Commodity Price Idx **(2.5%)**	MSCI:EM Gross (7.4%)	Blmbg:Aggregate (1.2%)	Blmbg:Commodity Price Idx **(1.0%)**	Blmbg:Commodity Price Idx **(7.7%)**	Blmbg:Commodity Price Idx **(6.6%)**

U.S. Large Cap (S&P 500) and U.S. Small Caps (Russell 2000) returned 17.9% and 15.2% last year, respectively, while International Equity only returned 2.7% (MSCI EAFE). Emerging Market Equities (MSCI EM) and U.S. Fixed Income (Blmbg. Aggregate) declined 0.4% and 1.2% last year.

Callan

Executive Summary for periods ended Sep. 30, 2018

Investment Performance Update –

- **TFFR earned a net investment return of 7.7% for the 1-year ended Sep. 30, 2018 versus a policy benchmark of 7.57%.** The U.S. equity markets were incredibly strong with TFFR's U.S. equity portfolio earning 19.8% last year (versus 17.6% for the Russell 3000) while TFFR's international equity strategies were up only 2.4% last year (versus a 2.0% benchmark). TFFR's world equity portfolio significantly underperformed the MSCI World Equity benchmark (actual +6.7% versus index +11.2%) primarily due to both of our world equity managers (most notably LSV, with a small cap, value tilt, and to a lesser extent, Epoch) posting historically poor returns (since inception). Private Equity returns continue to improve (up 8.3%) driven by recent vintages, but still trailed overall expectations. TFFR's fixed income returns were muted due to rising rates but exceeded benchmarks with Investment Grade posting a slight 0.06% gain (versus -1.22% for the Bloomberg U.S. Aggregate) while High Yield earned 4.8% last year (versus a 3.1% benchmark). Real Assets earned 6% last year (versus +5.7% benchmark) as results were mixed with infrastructure up 8.4% and real estate up 7%, while Timber declined 2.5% (versus the NCREIF Timber Index which increased 4% last year).
- **Asset allocation is the primary driver of returns noting that TFFR target allocation is 58% Equity, 23% Fixed Income, 18% Real Assets and 1% Cash. TFFR earned a net return of 7.8% for the 5-years ended September 30, 2018, which exceeded the performance benchmark of 7.0% (and long-term actuarial assumption of 7.75%).** During the last 5-years, TFFR earned approximately **$825 million** of net investment income including **$770 million** (or 93%) from asset allocation decisions and **$55 million**[1] (or 7%) from active management.
- Based on Callan's Public Fund Sponsor Database, TFFR returns were ranked in the **34th** percentile for the 5-years ended 9/30/18 on an unadjusted risk basis (and **2nd** percentile on an asset allocation adjusted basis).

Changes in Asset Class Portfolio Structures and Approaches –

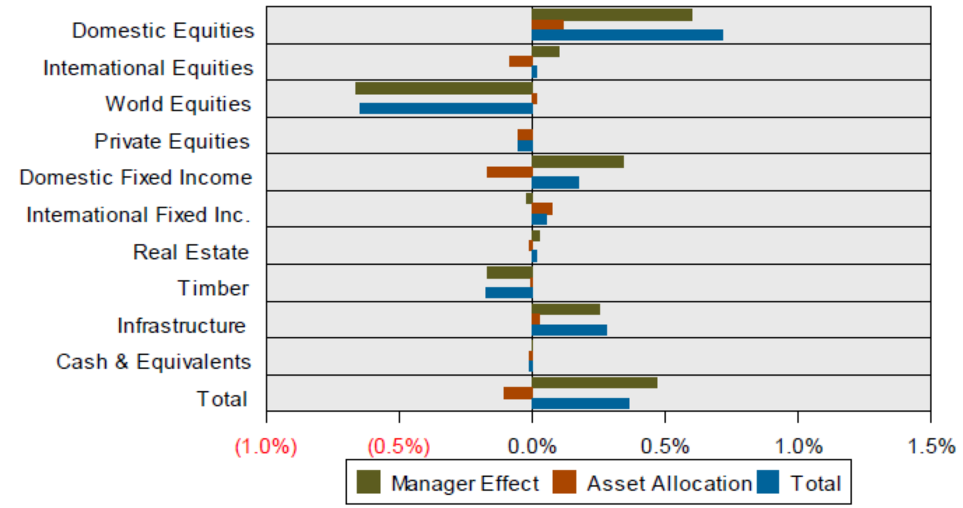
- In 2017, the SIB approved structural changes to eliminate agency MBS and international debt strategies. These changes are expected to improve risk adjusted returns within the Pension Pool largely due to the elimination of international debt with low expected returns and high expected volatility. **In order to implement these changes, the Fixed Income allocation was revised to reduce Investment Grade to 16% (from 19%) and increase High Yield to 7% (from 4%), while remaining constant at 23% in aggregate.**

Footnote 1: Assuming TFFR assets averaged $2.2 billion for the 5-years ended June 30, 2018 ($2.2 billion x 0.50% = $11 million x 5 years = $55 million).

TFFR Performance and Attribution

As of September 30, 2018

One Year Relative Attribution Effects



Returns for 1 Year Ended 09/30/2018

Return Type	Return (%)
Gross	7.94%
Net of fees	7.70%
Target	7.57%
Net added	0.13%

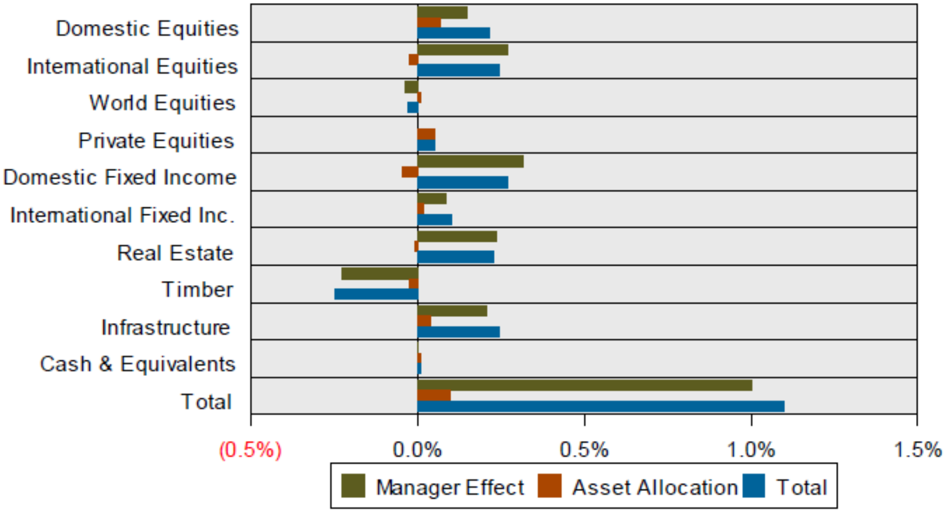
One Year Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equities	23%	21%	20.02%	17.24%	0.60%	0.12%	0.71%
International Equities	16%	15%	2.58%	2.03%	0.10%	(0.08%)	0.02%
World Equities	17%	16%	7.05%	11.24%	(0.66%)	0.02%	(0.64%)
Private Equities	3%	6%	8.38%	8.38%	0.00%	(0.05%)	(0.05%)
Domestic Fixed Income	21%	21%	1.58%	(0.05%)	0.34%	(0.17%)	0.17%
International Fixed Inc.	2%	2%	-	-	(0.02%)	0.07%	0.05%
Real Estate	10%	10%	7.51%	7.16%	0.03%	(0.01%)	0.02%
Timber	2%	2%	(2.52%)	4.00%	(0.17%)	(0.01%)	(0.17%)
Infrastructure	5%	6%	8.91%	3.64%	0.25%	0.03%	0.28%
Cash & Equivalents	1%	1%	1.70%	1.59%	0.00%	(0.01%)	(0.01%)
Total			**7.94% =**	**7.57% +**	**0.47% +**	**(0.10%)**	**0.36%**

TFFR Performance and Attribution

As of September 30, 2018

Five Year Annualized Relative Attribution Effects



Returns for 5 Year Ended 09/30/2018

Return Type	Return (%)
Gross	8.10%
Net of fees	7.80%
Target	7.00%
Net added	0.80%

Five Year Annualized Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return		Target Return		Manager Effect		Asset Allocation	Total Relative Return
Domestic Equities	23%	21%	13.85%		13.15%		0.15%		0.07%	0.22%
International Equities	15%	15%	5.95%		4.25%		0.27%		(0.02%)	0.25%
World Equities	16%	16%	9.01%		9.28%		(0.04%)		0.01%	(0.03%)
Private Equities	4%	5%	1.62%		1.62%		0.00%		0.05%	0.05%
Domestic Fixed Income	18%	18%	4.71%		3.00%		0.32%		(0.04%)	0.27%
International Fixed Inc.	4%	5%	-		-		0.09%		0.02%	0.10%
Real Estate	10%	10%	12.04%		9.57%		0.24%		(0.01%)	0.23%
Timber	3%	4%	(0.35%)		5.99%		(0.23%)		(0.02%)	(0.25%)
Infrastructure	4%	5%	6.32%		1.61%		0.21%		0.04%	0.24%
Cash & Equivalents	1%	1%	0.62%		0.52%		0.00%		0.01%	0.01%
Total			**8.10%**	**=**	**7.00%**	**+**	**1.00%**	**+**	**0.10%**	**1.10%**

Callan | Knowledge. Experience. Integrity.

Comparison of Major Asset Class Returns vs. Benchmark

Global Equities earned 10.60% for the 1-year ended Sep. 30, 2018, which was 0.21% below the benchmark, while the 5-year return of 9.28% surpassed the benchmark of 8.68% by 0.60%. **LSV, our largest global (or world) equity manager underperformed by 6% last year.**

Global Fixed Income earned 2.10% last year and 4.00% the last 5-years due to strong returns in U.S. Debt including high yield & private credit offset by weaker returns in International Debt and Long Term Treasuries due to rising rates.

Global Real Assets earned 5.98% last year and 7.73% the last 5-years with Real Estate and Infrastructure generally surpassing benchmarks while **Timber trailed the NCREIF Timber Index by 6%.**

Every major asset class outperformed their respective benchmarks for the 5-years ended Sep. 30, 2018, with strong returns in most sub-asset classes other than Private Equity and Timber.

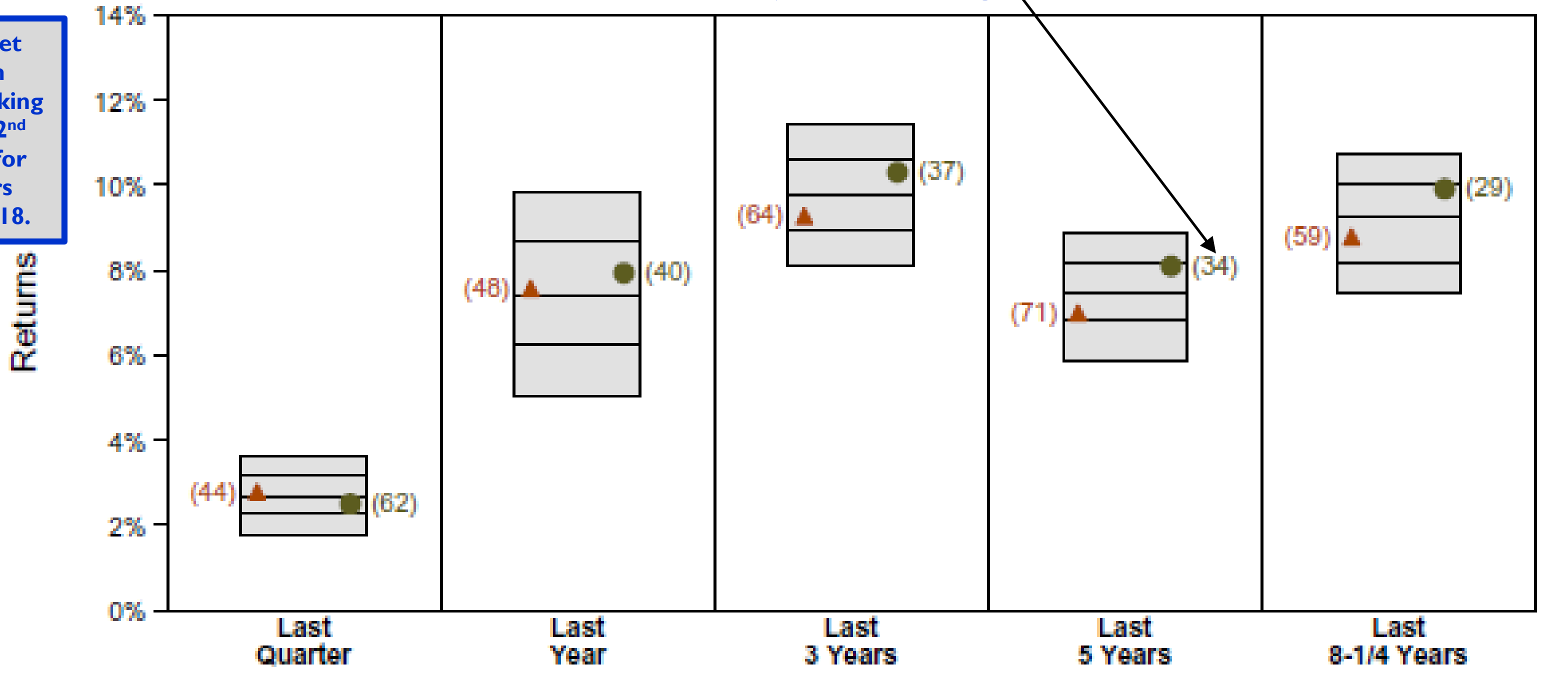
TFFR Asset Allocation	Target Allocation	1-year	5-years
Global Equity	58%		
- Actual		10.60%	9.28%
- Benchmark		10.81%	8.68%
		-0.21%	0.60%
Global Fixed Income	23%		
- Actual		2.10%	4.00%
- Benchmark		1.26%	2.57%
		0.84%	1.43%
Global Real Assets	18%		
- Actual		5.98%	7.73%
- Benchmark		5.64%	6.73%
		0.34%	1.00%
Cash Equivalents	1%		
- Actual		1.70%	0.62%
- Benchmark		1.59%	0.52%
		0.11%	0.10%
TFFR - Total Fund	100%		
- Actual		7.70%	7.80%
- Benchmark		7.57%	7.00%
		0.13%	0.80%

TFFR's "gross" returns were ranked in the 34th percentile for the 5-years ended Sep. 30, 2018, based on Callan's "Public Fund Sponsor Database".

Callan Public Fund Sponsor Database

TFFR's asset allocation adjusted ranking was in the 2nd percentile for the 5-years ended 9/30/18.

Unadjusted Ranking



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 8-1/4 Years
10th Percentile	3.64	9.86	11.44	8.89	10.72
25th Percentile	3.20	8.67	10.60	8.20	10.03
Median	2.66	7.40	9.79	7.50	9.26
75th Percentile	2.26	6.23	8.93	6.80	8.19
90th Percentile	1.77	5.03	8.12	5.85	7.49
Total Fund ●	2.50	7.94	10.31	8.10	9.91
Policy Target ▲	2.79	7.57	9.28	7.00	8.79

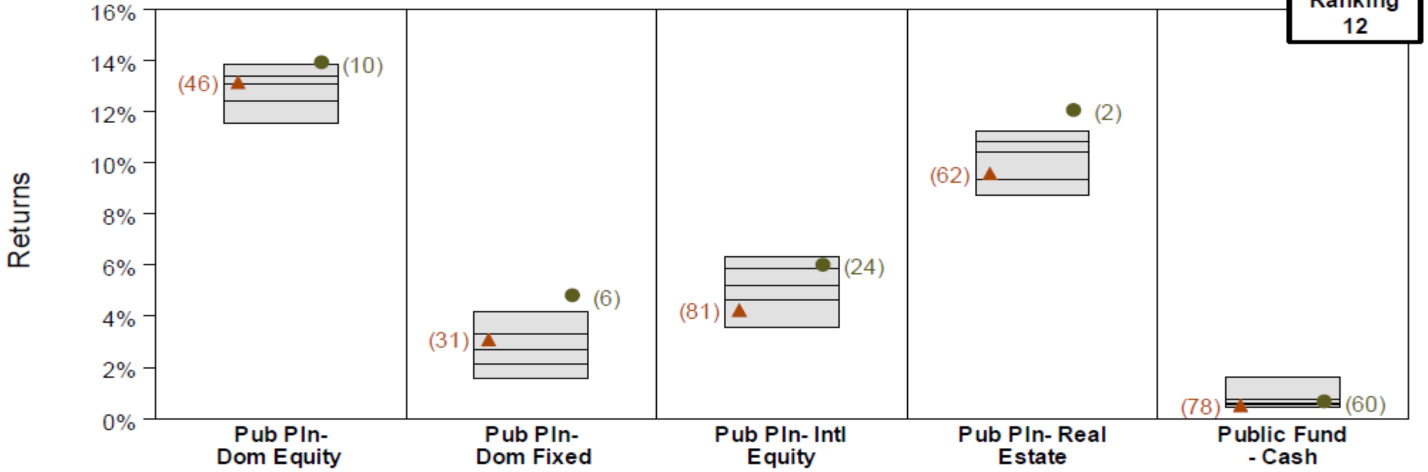
* Current Quarter Target = 16.6% Russell 1000 Index, 16.0% Blmbg Aggregate, 16.0% MSCI World, 11.8% MSCI World ex US, 10.0% NCREIF Total Index, 7.0% Blmbg HY 2% Iss Cap, 6.0% NDSIB TFFR - Private Equity, 4.8% Russell 2000 Index, 2.8% NCREIF NFI-ODCE Eq Wt Net, 2.8% CPI All Urban Cons lagged 3 months, 2.8% MSCI EM, 2.3% NCREIF Timberland Index and 1.0% 3-month Treasury Bill.

Asset Class Composite Results

Consolidated Pension Trust Asset Class Results vs. Other Public Pension Funds

Total Asset Class Performance
Five Years Ended September 30, 2018

Weighted Ranking
12

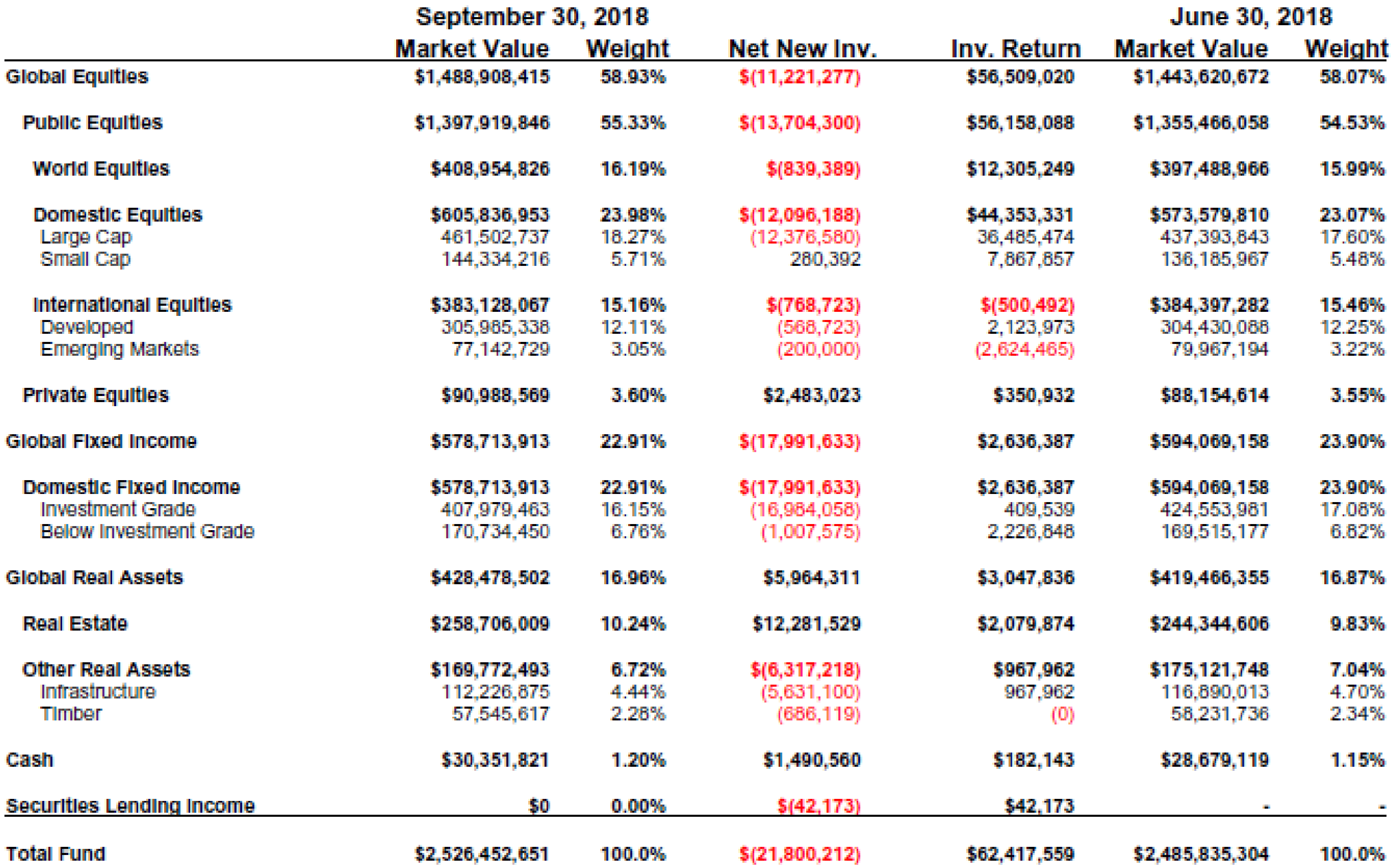


	Pub Pln- Dom Equity	Pub Pln- Dom Fixed	Pub Pln- Intl Equity	Pub Pln- Real Estate	Public Fund - Cash
10th Percentile	13.86	4.17	6.34	11.21	1.60
25th Percentile	13.40	3.32	5.89	10.85	0.77
Median	13.07	2.67	5.21	10.43	0.62
75th Percentile	12.40	2.12	4.62	9.34	0.57
90th Percentile	11.52	1.56	3.57	8.72	0.43
Asset Class Composite ●	13.86	4.76	5.95	12.00	0.61
Composite Benchmark ▲	13.14	3.09	4.24	9.57	0.52

- All asset classes led their respective benchmarks over the past five (5) years.
- Domestic equity, domestic fixed income, international equity and real estate all placed in the top quartile over past year.

NOTE: SIB utilizes the private markets to invest in real estate, infrastructure and timber (in addition to private equity and private debt).

Global Equity, Fixed Income and Real Asset Valuations



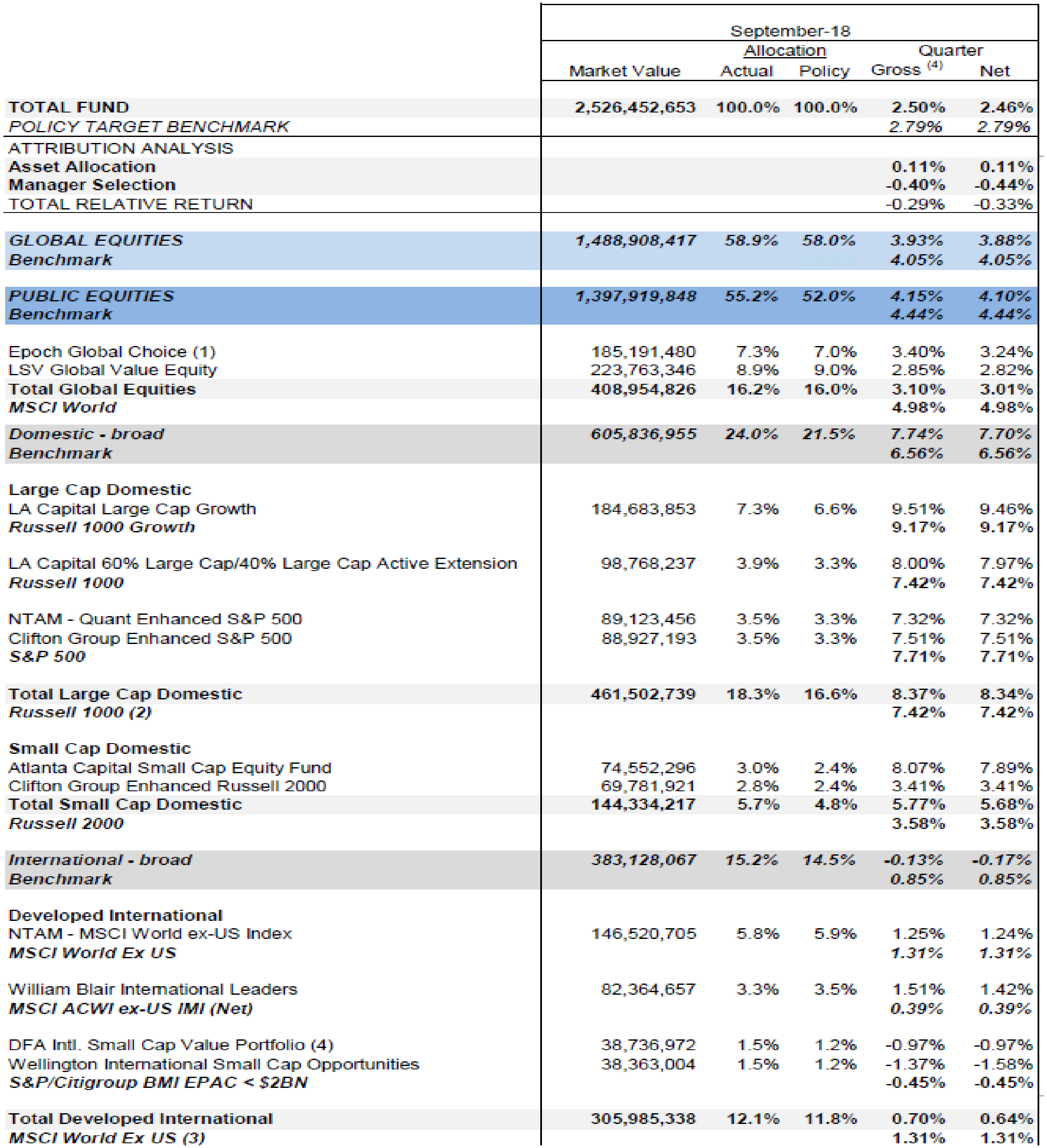
	September 30, 2018				June 30, 2018	
	Market Value	Weight	Net New Inv.	Inv. Return	Market Value	Weight
Global Equities	$1,488,908,415	58.93%	$(11,221,277)	$56,509,020	$1,443,620,672	58.07%
Public Equities	$1,397,919,846	55.33%	$(13,704,300)	$56,158,088	$1,355,466,058	54.53%
World Equities	$408,954,826	16.19%	$(839,389)	$12,305,249	$397,488,966	15.99%
Domestic Equities	$605,836,953	23.98%	$(12,096,188)	$44,353,331	$573,579,810	23.07%
Large Cap	461,502,737	18.27%	(12,376,580)	36,485,474	437,393,843	17.60%
Small Cap	144,334,216	5.71%	280,392	7,867,857	136,185,967	5.48%
International Equities	$383,128,067	15.16%	$(768,723)	$(500,492)	$384,397,282	15.46%
Developed	305,985,338	12.11%	(568,723)	2,123,973	304,430,088	12.25%
Emerging Markets	77,142,729	3.05%	(200,000)	(2,624,465)	79,967,194	3.22%
Private Equities	$90,988,569	3.60%	$2,483,023	$350,932	$88,154,614	3.55%
Global Fixed Income	$578,713,913	22.91%	$(17,991,633)	$2,636,387	$594,069,158	23.90%
Domestic Fixed Income	$578,713,913	22.91%	$(17,991,633)	$2,636,387	$594,069,158	23.90%
Investment Grade	407,979,463	16.15%	(16,984,058)	409,539	424,553,981	17.08%
Below Investment Grade	170,734,450	6.76%	(1,007,575)	2,226,848	169,515,177	6.82%
Global Real Assets	$428,478,502	16.96%	$5,964,311	$3,047,836	$419,466,355	16.87%
Real Estate	$258,706,009	10.24%	$12,281,529	$2,079,874	$244,344,606	9.83%
Other Real Assets	$169,772,493	6.72%	$(6,317,218)	$967,962	$175,121,748	7.04%
Infrastructure	112,226,875	4.44%	(5,631,100)	967,962	116,890,013	4.70%
Timber	57,545,617	2.28%	(686,119)	(0)	58,231,736	2.34%
Cash	$30,351,821	1.20%	$1,490,560	$182,143	$28,679,119	1.15%
Securities Lending Income	$0	0.00%	$(42,173)	$42,173	-	-
Total Fund	$2,526,452,651	100.0%	$(21,800,212)	$62,417,559	$2,485,835,304	100.0%

Note: The above table is unaudited and subject to change, but deemed to be materially accurate.

TFFR Net Returns for Periods Ended Sep. 30, 2018

TFFR earned a Net Investment Return of 2.46% for the quarter ended September 30, 2018, missing the Policy Target Benchmark Return of 2.79% by 0.33%.

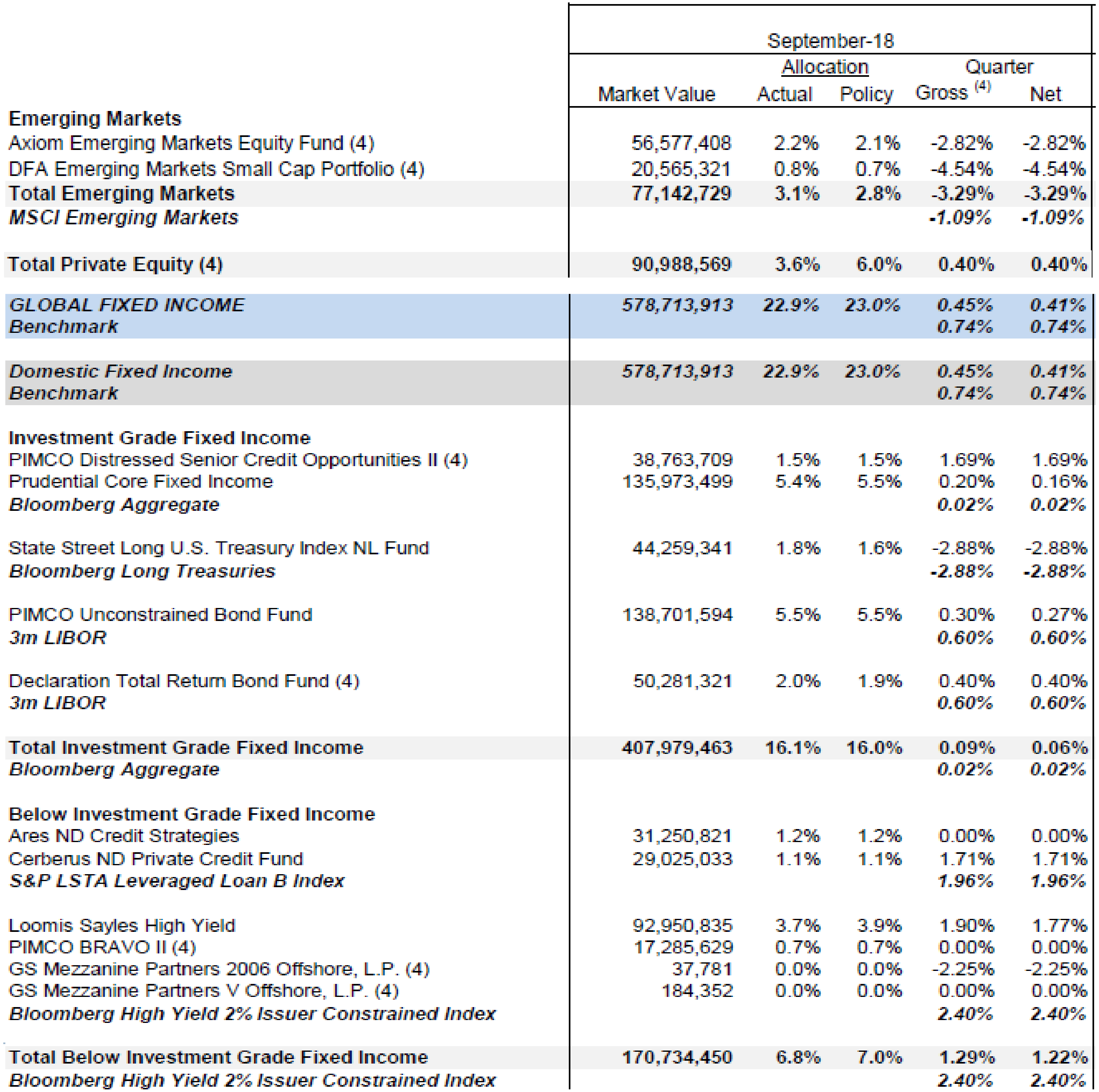
Equities earned 3.88% for the quarter below the benchmark of 4.05% largely due to sub-par returns for Epoch and LSV in Global Equities, DFA and Wellington in International Small Cap and Axiom and DFA in Emerging Markets (with the latter two shown on the next page).



	September-18				
		Allocation		Quarter	
	Market Value	Actual	Policy	Gross (4)	Net
TOTAL FUND	**2,526,452,653**	**100.0%**	**100.0%**	**2.50%**	**2.46%**
POLICY TARGET BENCHMARK				*2.79%*	*2.79%*
ATTRIBUTION ANALYSIS					
Asset Allocation				**0.11%**	**0.11%**
Manager Selection				**-0.40%**	**-0.44%**
TOTAL RELATIVE RETURN				-0.29%	-0.33%
GLOBAL EQUITIES	***1,488,908,417***	***58.9%***	***58.0%***	***3.93%***	***3.88%***
Benchmark				***4.05%***	***4.05%***
PUBLIC EQUITIES	***1,397,919,848***	***55.2%***	***52.0%***	***4.15%***	***4.10%***
Benchmark				***4.44%***	***4.44%***
Epoch Global Choice (1)	185,191,480	7.3%	7.0%	3.40%	3.24%
LSV Global Value Equity	223,763,346	8.9%	9.0%	2.85%	2.82%
Total Global Equities	**408,954,826**	**16.2%**	**16.0%**	**3.10%**	**3.01%**
MSCI World				**4.98%**	**4.98%**
Domestic - broad	***605,836,955***	***24.0%***	***21.5%***	***7.74%***	***7.70%***
Benchmark				***6.56%***	***6.56%***
Large Cap Domestic					
LA Capital Large Cap Growth	184,683,853	7.3%	6.6%	9.51%	9.46%
Russell 1000 Growth				**9.17%**	**9.17%**
LA Capital 60% Large Cap/40% Large Cap Active Extension	98,768,237	3.9%	3.3%	8.00%	7.97%
Russell 1000				**7.42%**	**7.42%**
NTAM - Quant Enhanced S&P 500	89,123,456	3.5%	3.3%	7.32%	7.32%
Clifton Group Enhanced S&P 500	88,927,193	3.5%	3.3%	7.51%	7.51%
S&P 500				**7.71%**	**7.71%**
Total Large Cap Domestic	**461,502,739**	**18.3%**	**16.6%**	**8.37%**	**8.34%**
Russell 1000 (2)				**7.42%**	**7.42%**
Small Cap Domestic					
Atlanta Capital Small Cap Equity Fund	74,552,296	3.0%	2.4%	8.07%	7.89%
Clifton Group Enhanced Russell 2000	69,781,921	2.8%	2.4%	3.41%	3.41%
Total Small Cap Domestic	**144,334,217**	**5.7%**	**4.8%**	**5.77%**	**5.68%**
Russell 2000				**3.58%**	**3.58%**
International - broad	***383,128,067***	***15.2%***	***14.5%***	***-0.13%***	***-0.17%***
Benchmark				***0.85%***	***0.85%***
Developed International					
NTAM - MSCI World ex-US Index	146,520,705	5.8%	5.9%	1.25%	1.24%
MSCI World Ex US				***1.31%***	***1.31%***
William Blair International Leaders	82,364,657	3.3%	3.5%	1.51%	1.42%
MSCI ACWI ex-US IMI (Net)				***0.39%***	***0.39%***
DFA Intl. Small Cap Value Portfolio (4)	38,736,972	1.5%	1.2%	-0.97%	-0.97%
Wellington International Small Cap Opportunities	38,363,004	1.5%	1.2%	-1.37%	-1.58%
S&P/Citigroup BMI EPAC < $2BN				**-0.45%**	**-0.45%**
Total Developed International	**305,985,338**	**12.1%**	**11.8%**	**0.70%**	**0.64%**
MSCI World Ex US (3)				**1.31%**	**1.31%**

TFFR Net Returns for Periods Ended Sep. 30, 2018

Fixed Income generated a 0.41% return for the 1st fiscal quarter, but underperformed the benchmark of 0.74% largely due to private market returns for Ares and PIMCO BRAVO II being reported on a quarterly lag. Ares and PIMCO BRAVO II earned 1.8% and 2.0%, respectively, for the quarter ended 9/30/18 (as reported in subsequent months).



	September-18				
		Allocation		Quarter	
	Market Value	Actual	Policy	Gross (4)	Net
Emerging Markets					
Axiom Emerging Markets Equity Fund (4)	56,577,408	2.2%	2.1%	-2.82%	-2.82%
DFA Emerging Markets Small Cap Portfolio (4)	20,565,321	0.8%	0.7%	-4.54%	-4.54%
Total Emerging Markets	**77,142,729**	**3.1%**	**2.8%**	**-3.29%**	**-3.29%**
MSCI Emerging Markets				***-1.09%***	***-1.09%***
Total Private Equity (4)	**90,988,569**	**3.6%**	**6.0%**	**0.40%**	**0.40%**
GLOBAL FIXED INCOME	***578,713,913***	***22.9%***	***23.0%***	***0.45%***	***0.41%***
Benchmark				***0.74%***	***0.74%***
Domestic Fixed Income	***578,713,913***	***22.9%***	***23.0%***	***0.45%***	***0.41%***
Benchmark				***0.74%***	***0.74%***
Investment Grade Fixed Income					
PIMCO Distressed Senior Credit Opportunities II (4)	38,763,709	1.5%	1.5%	1.69%	1.69%
Prudential Core Fixed Income	135,973,499	5.4%	5.5%	0.20%	0.16%
Bloomberg Aggregate				***0.02%***	***0.02%***
State Street Long U.S. Treasury Index NL Fund	44,259,341	1.8%	1.6%	-2.88%	-2.88%
Bloomberg Long Treasuries				***-2.88%***	***-2.88%***
PIMCO Unconstrained Bond Fund	138,701,594	5.5%	5.5%	0.30%	0.27%
3m LIBOR				***0.60%***	***0.60%***
Declaration Total Return Bond Fund (4)	50,281,321	2.0%	1.9%	0.40%	0.40%
3m LIBOR				***0.60%***	***0.60%***
Total Investment Grade Fixed Income	**407,979,463**	**16.1%**	**16.0%**	**0.09%**	**0.06%**
Bloomberg Aggregate				***0.02%***	***0.02%***
Below Investment Grade Fixed Income					
Ares ND Credit Strategies	31,250,821	1.2%	1.2%	0.00%	0.00%
Cerberus ND Private Credit Fund	29,025,033	1.1%	1.1%	1.71%	1.71%
S&P LSTA Leveraged Loan B Index				***1.96%***	***1.96%***
Loomis Sayles High Yield	92,950,835	3.7%	3.9%	1.90%	1.77%
PIMCO BRAVO II (4)	17,285,629	0.7%	0.7%	0.00%	0.00%
GS Mezzanine Partners 2006 Offshore, L.P. (4)	37,781	0.0%	0.0%	-2.25%	-2.25%
GS Mezzanine Partners V Offshore, L.P. (4)	184,352	0.0%	0.0%	0.00%	0.00%
Bloomberg High Yield 2% Issuer Constrained Index				***2.40%***	***2.40%***
Total Below Investment Grade Fixed Income	**170,734,450**	**6.8%**	**7.0%**	**1.29%**	**1.22%**
Bloomberg High Yield 2% Issuer Constrained Index				***2.40%***	***2.40%***

TFFR Net Returns for Periods Ended Sep. 30, 2018

Global Real Assets earned 0.67% and trailed the benchmark of 1.51% last quarter largely due to the quarterly lag in reporting private market investment returns in the 1st fiscal quarter of each year as evidenced by 0.00% returns being reported for many line items including Invesco, TIR, and Grosvenor.

Cash returns were consistent with the 90-day U.S. T-Bill benchmark index.

	September-18				
		Allocation		Quarter	
	Market Value	Actual	Policy	Gross (4)	Net
GLOBAL REAL ASSETS	***428,478,502***	***17.0%***	***18.0%***	***0.71%***	***0.67%***
Benchmark				***1.51%***	***1.51%***
Global Real Estate					
Invesco Core Real Estate - U.S.A., L.P.	125,393,714			0.00%	0.00%
INVESCO Real Estate Fund II (4)	76,870			0.00%	0.00%
Invesco Real Estate Fund III, LP (4)	7,887,609			0.00%	0.00%
Invesco U.S. Value-Add Fund IV, L.P. (4)	20,330,883			0.00%	0.00%
Invesco Asia Real Estate Fund I, L.P. (4)	100,143			0.00%	0.00%
Invesco Asia Real Estate Fund III, L.P. (4)	1,699,790			-0.82%	-0.82%
JP Morgan Strategic & Special Situation Property Blend	100,600,804			2.14%	1.95%
JP Morgan Alternative Property Fund	130,916			0.00%	0.00%
JP Morgan European Opportunistic Property Fund III (4)	2,185,354			-0.41%	-0.41%
JP Morgan Greater China Property Fund (4)	299,926			0.00%	0.00%
Total Global Real Estate	258,706,009	10.2%	10.0%	0.81%	0.74%
NCREIF TOTAL INDEX				*1.67%*	*1.67%*
OTHER REAL ASSETS	***169,772,493***	***6.7%***	***8.0%***	***0.56%***	***0.57%***
Benchmark				***1.31%***	***1.31%***
Timber					
TIR Teredo Timber, LLC	13,629,758	0.5%		0.00%	0.00%
TIR Springbank, LLC	43,915,860	1.7%		0.00%	0.00%
Total Timber (4)	57,545,617	2.3%	2.3%	0.00%	0.00%
NCREIF Timberland Index				*1.02%*	*1.02%*
Infrastructure					
Rohatyn Group Asian Infrastructure & Related Resources (4)	8,604,357	0.3%		-5.83%	-5.83%
JP Morgan Infrastructure Investments Fund (IIF)	82,184,236	3.3%		1.70%	1.73%
ISQ Global Infrastructure Fund II	1,601,159	0.1%		5.95%	5.95%
Grosvenor Customized Infrastructure Strategies, LP (4)	12,951,690	0.5%		-0.05%	-0.05%
Grosvenor Customized Infrastructure Strategies II (4)	6,885,433	0.3%		0.00%	0.00%
Total Infrastructure	112,226,875	4.4%	5.7%	0.83%	0.86%
CPI				*1.43%*	*1.43%*
Cash Equivalents					
Northern Trust Collective STIF	25,225,297			0.49%	0.49%
Bank of ND	5,126,524			0.50%	0.50%
Total Cash Equivalents	30,351,821	1.2%	1.0%	0.53%	0.53%
90 Day T-Bill				*0.49%*	*0.49%*

NOTE: Monthly returns and market values are preliminary and subject to change.

TEACHERS' FUND FOR RETIREMENT
A Division of ND Retirement and Investment Office
Statement of Net Position
As of 11/30/2018

	As of 11-30-18	As of 6-30-18
ASSETS:		
INVESTMENTS (AT FAIR VALUE)		
GLOBAL EQUITIES	$ 1,411,579,244	$ 1,441,132,463
GLOBAL FIXED INCOME	546,034,846	589,368,951
GLOBAL REAL ASSETS	435,626,859	416,937,112
INVESTED CASH (NOTE 1)	17,416,622	28,631,157
TOTAL INVESTMENTS	2,410,657,571	2,476,069,683
RECEIVABLES		
DIVIDEND/INTEREST RECEIVABLE	9,456,733	9,765,629
CONTRIBUTIONS RECEIVABLE	(3,107,581)	26,548,463
MISCELLANEOUS RECEIVABLE	5,481	8,301
TOTAL RECEIVABLES	6,354,633	36,322,393
OTHER ASSETS		
INVESTED SECURITIES LENDING COLLATERAL (NOTE 2)	5,454,186	7,413,200
OPERATING CASH (NOTE 3)	19,567,847	20,486,449
FIXED ASSETS (NET OF ACCUM DEPR)	6,749	6,749
TOTAL ASSETS	2,442,040,986	2,540,298,474
DEFERRED OUTFLOWS OF RESOURCES		
DEFERRED OUTFLOWS RELATED TO PENSIONS	736,644	813,903
LIABILITIES:		
SECURITIES LENDING COLLATERAL (NOTE 2)	5,454,186	7,413,200
ACCOUNTS PAYABLE	98,377	138,447
ACCRUED EXPENSES	2,161,318	2,395,362
INVESTMENT EXPENSES PAYABLE	459,438	459,438
TOTAL LIABILITIES	8,173,319	10,406,447
DEFERRED INFLOWS OF RESOURCES		
DEFERRED INFLOWS RELATED TO PENSIONS	48,519	48,519
NET POSITION:		
HELD IN TRUST	2,434,555,792	2,530,657,411
TOTAL NET POSITION	$ 2,434,555,792	$ 2,530,657,411

TEACHERS' FUND FOR RETIREMENT
A Division of ND Retirement and Investment Office
Statement of Changes in Net Position
For the Month Ended 11/30/2018

	Month Ended 11-30-18	Year-to-Date
ADDITIONS:		
INVESTMENT INCOME		
GAIN ON SALE OF INVESTMENTS	$ 28,785,128	$ 120,937,633
LOSS ON SALE OF INVESTMENTS	21,884,261	98,390,953
NET GAINS (LOSSES) INVESTMENTS	6,900,867	22,546,680
NET APPREC (DEPREC) MARKET VALUE	4,805,208	(77,974,334)
NET CHANGE IN FAIR VALUE OF INVESTMENTS	11,706,075	(55,427,654)
INTEREST, DIVIDEND & OTHER INVESTMENT INCOME	5,736,968	21,182,880
	17,443,043	(34,244,774)
LESS INVESTMENT EXPENSES	472,767	2,478,525
NET INCOME FROM INVESTING ACTIVITIES	16,970,276	(36,723,299)
SECURITIES LENDING INCOME	17,219	85,589
SECURITIES LENDING EXPENSES	3,443	17,112
NET SECURITIES LENDING INCOME	13,776	68,477
NET INVESTMENT INCOME	[illegible]	(36,654,822)
PURCHASE OF UNITS ($1/UNIT) (NOTE 4)	23,225,000	127,300,000
MEMBER & EMPLOYER CONTRIBUTIONS (NOTE 6)	15,129,150	33,509,918
PURCHASED SERVICE CREDIT (NOTE 7)	115,055	652,495
PENALTY & INTEREST (NOTE 8)	60,426	81,855
TOTAL ADDITIONS	55,513,683	124,889,446
DEDUCTIONS:		
BENEFITS PAID PARTICIPANTS (NOTE 9)	17,865,737	89,293,010
PARTIAL LUMP SUM BENEFITS PAID	-	900,242
REFUNDS TO MEMBER (NOTE 10)	745,662	2,764,524
TOTAL BENEFITS PAID	18,611,399	92,957,776
ADMINISTRATIVE EXPENSES	131,144	733,289
REDEMPTION OF UNITS ($1/UNIT) (NOTE 5)	23,225,000	127,300,000
TOTAL DEDUCTIONS	41,967,543	220,991,065
CHANGE IN NET POSITION	[illegible]	(96,101,619)
NET POSITION:		
BEGINNING OF PERIOD	2,421,009,652	2,530,657,411
END OF PERIOD	$ 2,434,555,792	$ 2,434,555,792

These financial statements are preliminary, unaudited and subject to change. 1/7/2019

TFFR assets declined to $2.43 billion at November 30, 2018, from $2.53 billion at June 30, 2018.

TFFR Preliminary FYTD Returns – November 30, 2018

	November-18			Current FYTD
		Allocation		
	Market Value	Actual	Policy	Net
TOTAL FUND	**2,420,114,305**	**100.0%**	**100.0%**	**-1.33%**
POLICY TARGET BENCHMARK				*-0.83%*
TOTAL RELATIVE RETURN				-0.50%
GLOBAL EQUITIES	***1,414,527,198***	***58.4%***	***58.0%***	***-2.98%***
Benchmark			***52.0%***	***-2.22%***
PUBLIC EQUITIES	***1,332,472,181***	***52.6%***	***52.0%***	***-3.08%***
Benchmark				***-2.40%***
Epoch Global Choice (1)	174,286,415	7.2%	7.0%	-2.87%
LSV Global Value Equity	219,791,621	9.1%	9.0%	-2.84%
Total Global Equities	**394,078,036**	**16.3%**	**16.0%**	**-2.86%**
MSCI World				***-1.62%***
Domestic - broad	***566,164,548***	***23.4%***	***21.5%***	***0.74%***
Benchmark				***0.00%***
LA Capital Large Cap Growth	169,817,825	7.0%	6.6%	0.65%
Russell 1000 Growth				***0.46%***
LA Capital 60% Large Cap/40% Large Cap Active Extension	93,778,113	3.9%	3.3%	2.52%
Russell 1000				***1.85%***
NTAM - Quant Enhanced S&P 500	85,306,652	3.5%	3.3%	2.72%
Clifton Group Enhanced S&P 500	84,303,485	3.5%	3.3%	1.92%
S&P 500				***2.39%***
Total Large Cap Domestic	**433,206,075**	**17.9%**	**16.6%**	**1.70%**
Russell 1000 (2)				***1.85%***
Atlanta Capital Small Cap Equity Fund	68,887,591	2.8%	2.4%	1.70%
Clifton Group Enhanced Russell 2000	64,070,882	2.6%	2.4%	-6.32%
Total Small Cap Domestic	**132,958,473**	**5.5%**	**4.8%**	**-2.27%**
Russell 2000				***-6.21%***
International - broad	***372,229,597***	***15.4%***	***14.5%***	***-9.01%***
Benchmark				***-6.65%***
Developed International				
NTAM - MSCI World ex-US Index	139,707,460	5.8%	5.9%	-6.69%
MSCI World Ex US				***-6.83%***
William Blair International Leaders	81,159,077	3.4%	3.5%	-9.62%
MSCI ACWI ex-US IMI (Net)				***-7.22%***
DFA Intl. Small Cap Value Portfolio (4)	34,509,054	1.4%	1.2%	-12.47%
Wellington International Small Cap Opportunities	33,539,947	1.4%	1.2%	-14.62%
S&P/Citigroup BMI EPAC < $2BN				***-10.02%***
Total Developed International	**288,915,539**	**11.9%**	**11.8%**	**-9.24%**
MSCI World Ex US (3)				***-6.83%***
Axiom Emerging Markets Equity Fund (4)	59,002,836	2.4%	2.1%	-8.16%
DFA Emerging Markets Small Cap Portfolio (4)	24,311,222	1.0%	0.7%	-8.28%
Total Emerging Markets	**83,314,058**	**3.4%**	**2.8%**	**-8.14%**
MSCI Emerging Markets				***-5.99%***
Total Private Equity (4)	**82,055,017**	**3.4%**	**6.0%**	**-1.14%**

TFFR Preliminary FYTD Returns – November 30, 2018

	November-18			Current FYTD
		Allocation		
	Market Value	Actual	Policy	Net
GLOBAL FIXED INCOME	***550,636,464***	***22.8%***	***23.0%***	***0.16%***
Benchmark				***-0.15%***
Investment Grade Fixed Income				
PIMCO Distressed Senior Credit Opportunities II (4)	38,428,470	1.6%	1.6%	1.66%
Prudential Core Fixed Income	130,577,300	5.4%	5.4%	-0.15%
Bloomberg Aggregate				***-0.18%***
State Street Long U.S. Treasury Index NL Fund	38,216,207	1.6%	1.6%	-4.09%
Bloomberg Long Treasuries				***-4.06%***
PIMCO Unconstrained Bond Fund	129,622,347	5.4%	5.4%	0.10%
3m LIBOR				***1.05%***
Declaration Total Return Bond Fund (4)	45,703,870	1.9%	1.9%	0.67%
3m LIBOR				***1.05%***
Total Investment Grade Fixed Income	**382,548,194**	**15.8%**	**16.0%**	**-0.20%**
Bloomberg Aggregate				***-0.18%***
Below Investment Grade Fixed Income				
Ares ND Credit Strategies	31,812,689	1.3%	1.3%	1.80%
Cerberus ND Private Credit Fund	29,552,142	1.2%	1.2%	3.56%
S&P LSTA Leveraged Loan B Index				***1.15%***
Loomis Sayles High Yield	91,141,372	3.8%	3.8%	-0.21%
PIMCO BRAVO II (4)	15,365,094	0.6%	0.6%	2.00%
GS Mezzanine Partners 2006 Offshore, L.P. (4)	40,219	0.0%	0.0%	4.06%
GS Mezzanine Partners V Offshore, L.P. (4)	176,755	0.0%	0.0%	33.64%
Bloomberg High Yield 2% Issuer Constrained Index				***-0.10%***
Total Below Investment Grade Fixed Income	**168,088,270**	**6.9%**	**7.0%**	**1.02%**
Bloomberg High Yield 2% Issuer Constrained Index				***-0.10%***
GLOBAL REAL ASSETS	***437,499,445***	***18.1%***	***18.0%***	***1.93%***
Benchmark				***2.44%***
Total Global Real Estate	**264,207,879**	**10.9%**	**10.0%**	**2.65%**
NCREIF TOTAL INDEX				***2.80%***
OTHER REAL ASSETS	***173,291,566***	***7.2%***	***8.0%***	***0.83%***
Benchmark				***1.98%***
Total Timber (4)	**58,457,572**	**2.4%**	**2.4%**	**1.58%**
NCREIF Timberland Index				***1.71%***
Total Infrastructure	**114,833,994**	**4.7%**	**5.6%**	**0.44%**
50% NCREIF ODCE/50% CPI-U (lagged one quarter)				***2.09%***
Total Cash Equivalents	**17,451,197**	**0.7%**	**1.0%**	**0.90%**
90 Day T-Bill				***0.87%***

NOTE: Monthly returns and market values are preliminary and subject to change.

TFFR Estimated Fiscal Year To Date Returns – Dec. 31, 2018

Estimated YTD Through **12/31/2018**

(Actual returns are net of fees; estimates are gross indices)

		TFFR
Market Value	**30-Nov**	**2,420,114,305**
Total Fund Actual through	30-Nov	**-1.33%**
Total Fund Policy through	30-Nov	-0.83%
	31-Dec	
MSCI World	-7.60%	16.0%
Russell 1000	-9.11%	16.6%
Russell 2000	-11.88%	4.8%
MSCI World ex US	-5.17%	11.8%
MSCI Emerging Mkts	-2.66%	2.8%
BC Aggregate	1.84%	16.0%
High Yield	-2.14%	7.0%
Real Estate	0.56%	10.0%
Private Equity	0.00%	6.0%
Timber	0.34%	2.4%
Infrastructure	0.09%	5.6%
T-Bill	0.18%	1.0%
Est. MTD through	**12/31/2018**	**-3.77%**
Estimated FYTD Return	**12/31/2018**	**-5.05%**
Estimated FYTD Policy	12/31/2018	-4.56%
Comparison to 8% return assumption pro-rated FYTD		
Comparison to 7.75% return assumption pro-rated FYTD		***3.83%***

The above estimates are preliminary, unaudited and subject to change.

The Callan Periodic Table of Investment Returns

Annual Returns for Key Indices Ranked in Order of Performance (1999–2018)

1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Non-U.S. Equity 27.92%	Real Estate 13.84%	U.S. Fixed Income 8.43%	Non-U.S. Fixed Income 22.37%	Emerging Market Equity 55.82%	Real Estate 37.96%	Emerging Market Equity 34.00%	Real Estate 42.12%	Emerging Market Equity 39.38%	U.S. Fixed Income 5.24%
Small Cap Equity 21.26%	U.S. Fixed Income 11.63%	High Yield 5.28%	U.S. Fixed Income 10.26%	Small Cap Equity 47.25%	Emerging Market Equity 25.55%	Real Estate 15.35%	Emerging Market Equity 32.17%	Non-U.S. Equity 12.44%	Non-U.S. Fixed Income 4.39%
Large Cap Equity 21.04%	Cash Equivalent 6.18%	Cash Equivalent 4.42%	Real Estate 2.82%	Real Estate 40.69%	Non-U.S. Equity 20.38%	Non-U.S. Equity 14.47%	Non-U.S. Equity 25.71%	Non-U.S. Fixed Income 11.03%	Cash Equivalent 2.06%
Real Estate 8.87%	Small Cap Equity -3.02%	Small Cap Equity 2.49%	Cash Equivalent 1.78%	Non-U.S. Equity 39.42%	Small Cap Equity 18.33%	Large Cap Equity 4.91%	Small Cap Equity 18.37%	U.S. Fixed Income 6.97%	High Yield -26.16%
Cash Equivalent 4.85%	Non-U.S. Fixed Income -3.91%	Emerging Market Equity -2.61%	High Yield -1.37%	High Yield 28.97%	Non-U.S. Fixed Income 12.54%	Small Cap Equity 4.55%	Large Cap Equity 15.79%	Large Cap Equity 5.49%	Small Cap Equity -33.79%
High Yield 2.39%	High Yield -5.86%	Non-U.S. Fixed Income -3.75%	Emerging Market Equity -6.16%	Large Cap Equity 28.68%	High Yield 11.13%	Cash Equivalent 3.07%	High Yield 11.85%	Cash Equivalent 5.00%	Large Cap Equity -37.00%
U.S. Fixed Income -0.83%	Large Cap Equity -9.11%	Real Estate -3.81%	Non-U.S. Equity -15.80%	Non-U.S. Fixed Income 19.36%	Large Cap Equity 10.88%	High Yield 2.74%	Non-U.S. Fixed Income 8.16%	High Yield 1.87%	Non-U.S. Equity -43.56%
Non-U.S. Fixed Income -8.83%	Non-U.S. Equity -13.37%	Large Cap Equity -11.89%	Small Cap Equity -20.48%	U.S. Fixed Income 4.10%	U.S. Fixed Income 4.34%	U.S. Fixed Income 2.43%	Cash Equivalent 4.85%	Small Cap Equity -1.57%	Real Estate -48.21%
		Non-U.S. Equity -21.40%	Large Cap Equity -22.10%	Cash Equivalent 1.15%	Cash Equivalent 1.33%	Non-U.S. Fixed Income -8.65%	U.S. Fixed Income 4.33%	Real Estate -7.39%	Emerging Market Equity -53.33%

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Emerging Market Equity 78.51%	Small Cap Equity 26.85%	U.S. Fixed Income 7.84%	Real Estate 27.73%	Small Cap Equity 38.82%	Real Estate 15.02%	Large Cap Equity 1.38%	Small Cap Equity 21.31%	Emerging Market Equity 37.28%	Cash Equivalent 1.87%
High Yield 58.21%	Real Estate 19.63%	High Yield 4.98%	Emerging Market Equity 18.23%	Large Cap Equity 32.39%	Large Cap Equity 13.69%	U.S. Fixed Income 0.55%	High Yield 17.13%	Non-U.S. Equity 24.21%	U.S. Fixed Income 0.01%
Real Estate 37.13%	Emerging Market Equity 18.88%	Non-U.S. Fixed Income 4.36%	Non-U.S. Equity 16.41%	Non-U.S. Equity 21.02%	U.S. Fixed Income 5.97%	Cash Equivalent 0.05%	Large Cap Equity 11.96%	Large Cap Equity 21.83%	High Yield -2.08%
Non-U.S. Equity 33.67%	High Yield 15.12%	Large Cap Equity 2.11%	Small Cap Equity 16.35%	High Yield 7.44%	Small Cap Equity 4.89%	Real Estate -0.79%	Emerging Market Equity 11.19%	Small Cap Equity 14.65%	Non-U.S. Fixed Income -2.15%
Small Cap Equity 27.17%	Large Cap Equity 15.06%	Cash Equivalent 0.10%	Large Cap Equity 16.00%	Real Estate 3.67%	High Yield 2.45%	Non-U.S. Equity -3.04%	Real Estate 4.06%	Non-U.S. Fixed Income 10.51%	Large Cap Equity -4.38%
Large Cap Equity 26.47%	Non-U.S. Equity 8.95%	Small Cap Equity -4.18%	High Yield 15.81%	Cash Equivalent 0.07%	Cash Equivalent 0.03%	Small Cap Equity -4.41%	Non-U.S. Equity 2.75%	Real Estate 10.36%	Real Estate -5.63%
Non-U.S. Fixed Income 7.53%	U.S. Fixed Income 6.54%	Real Estate -6.46%	U.S. Fixed Income 4.21%	U.S. Fixed Income -2.02%	Emerging Market Equity -2.19%	High Yield -4.47%	U.S. Fixed Income 2.65%	High Yield 7.50%	Small Cap Equity -11.01%
U.S. Fixed Income 5.93%	Non-U.S. Fixed Income 4.95%	Non-U.S. Equity -12.21%	Non-U.S. Fixed Income 4.09%	Emerging Market Equity -2.60%	Non-U.S. Fixed Income -3.09%	Non-U.S. Fixed Income -6.02%	Non-U.S. Fixed Income 1.49%	U.S. Fixed Income 3.54%	Non-U.S. Equity -14.09%
Cash Equivalent 0.21%	Cash Equivalent 0.13%	Emerging Market Equity -18.42%	Cash Equivalent 0.11%	Non-U.S. Fixed Income -3.08%	Non-U.S. Equity -4.32%	Emerging Market Equity -14.92%	Cash Equivalent 0.33%	Cash Equivalent 0.86%	Emerging Market Equity -14.58%

The Callan Periodic Table of Investment Returns conveys the strong ***case for diversification*** across asset classes (stocks vs. bonds), capitalizations (large vs. small), and equity markets (U.S. vs. non-U.S.). The Table highlights the uncertainty inherent in all capital markets. Rankings change every year. Also noteworthy is the difference between absolute and relative performance, as returns for the top-performing asset class span a wide range over the past 20 years.

20th Anniversary Edition

Callan | **Knowledge. Experience. Integrity.**

The Callan Periodic Table of Investment Returns 1999–2018

Callan's Periodic Table of Investment Returns depicts annual returns for 8 asset classes, ranked from best to worst performance for each calendar year. The asset classes are color-coded to enable easy tracking over time. We describe the well-known, industry-standard market indices that we use as proxies for each asset class in the text below.

- **Large Cap Equity (S&P 500)** measures the performance of large capitalization U.S. stocks. The S&P 500 is a market-value-weighted index of 500 stocks. The weightings make each company's influence on the Index performance directly proportional to that company's market value.
- **Small Cap Equity (Russell 2000)** measures the performance of small capitalization U.S. stocks. The Russell 2000 is a market-value-weighted index of the 2,000 smallest stocks in the broad-market Russell 3000 Index.
- **Non-U.S. Equity (MSCI World ex USA)** is an international index that is designed to measure the performance of large and mid cap equities in developed markets in Europe, the Middle East, the Pacific region, and Canada.
- **Emerging Market Equity (MSCI Emerging Markets)** is an international index that is designed to measure the performance of equity markets in 24 emerging countries around the world.
- **U.S. Fixed Income (Bloomberg Barclays US Aggregate Bond Index)** includes U.S. government, corporate, and mortgage-backed securities with maturities of at least one year.
- **High Yield (Bloomberg Barclays High Yield Bond Index)** measures the market of USD-denominated, non-investment grade, fixed-rate, taxable corporate bonds. Securities are classified as high yield if the middle rating of Moody's, Fitch, and S&P is Ba1/BB+/BB+ or below, excluding emerging market debt.
- **Non-U.S. Fixed Income (Bloomberg Barclays Global Aggregate ex US Bond Index)** is an unmanaged index that is comprised of several other Bloomberg Barclays indices that measure the fixed income performance of regions around the world, excluding the U.S.
- **Real Estate (FTSE EPRA/NAREIT Developed REIT Index)** is designed to measure the stock performance of companies engaged in specific real estate activities in the North American, European, and Asian real estate markets.
- **Cash Equivalent (3-month Treasury Bill)** is a short-term debt obligation backed by the Treasury Department of the U.S. government with a maturity of less than one year.

Callan's Periodic Table Marks a Milestone in Its History

For the first time in the history of Callan's Periodic Table of Investment Returns, stretching back to 1979, the best-performing asset class in 2018 returned essentially zero! It is an unusual year when virtually all broad asset classes post negative returns. Rising interest rates hit fixed income, while a sell-off in the fourth quarter dinged equity returns around the globe. Cash—the risk-free alternative—was positive, up 1.87%. A selection of bond market segments (government bonds, mortgages, asset-backed securities, and municipal bonds) generated positive returns, but the broad fixed income market returned 0.01%. Volatility returned to the global equity markets in 2018, following several years of below-average readings during which the return to U.S. equity trended up strongly. This recent volatility, which is not remarkable from a historical standpoint, could well be a harbinger of 2019 market performance given a wide array of economic, political, and market-related uncertainties that are currently vexing investors. Callan has long advised clients that adherence to an appropriate and well-defined asset allocation (including periodic rebalancing!) remains the best course of action to manage the path to successful attainment of long-term investment goals.

Callan

Callan was founded as an employee-owned investment consulting firm in 1973. Ever since, we have empowered institutional clients with creative, customized investment solutions backed by proprietary research, exclusive data, and ongoing education. Today, Callan advises on more than $2 trillion in total fund sponsor assets, which makes it among the largest independently owned investment consulting firms in the U.S. We use a client-focused consulting model to serve pension and defined contribution plan sponsors, endowments, foundations, independent investment advisers, investment managers, and other asset owners. Callan has six offices throughout the U.S. Learn more at www.callan.com.

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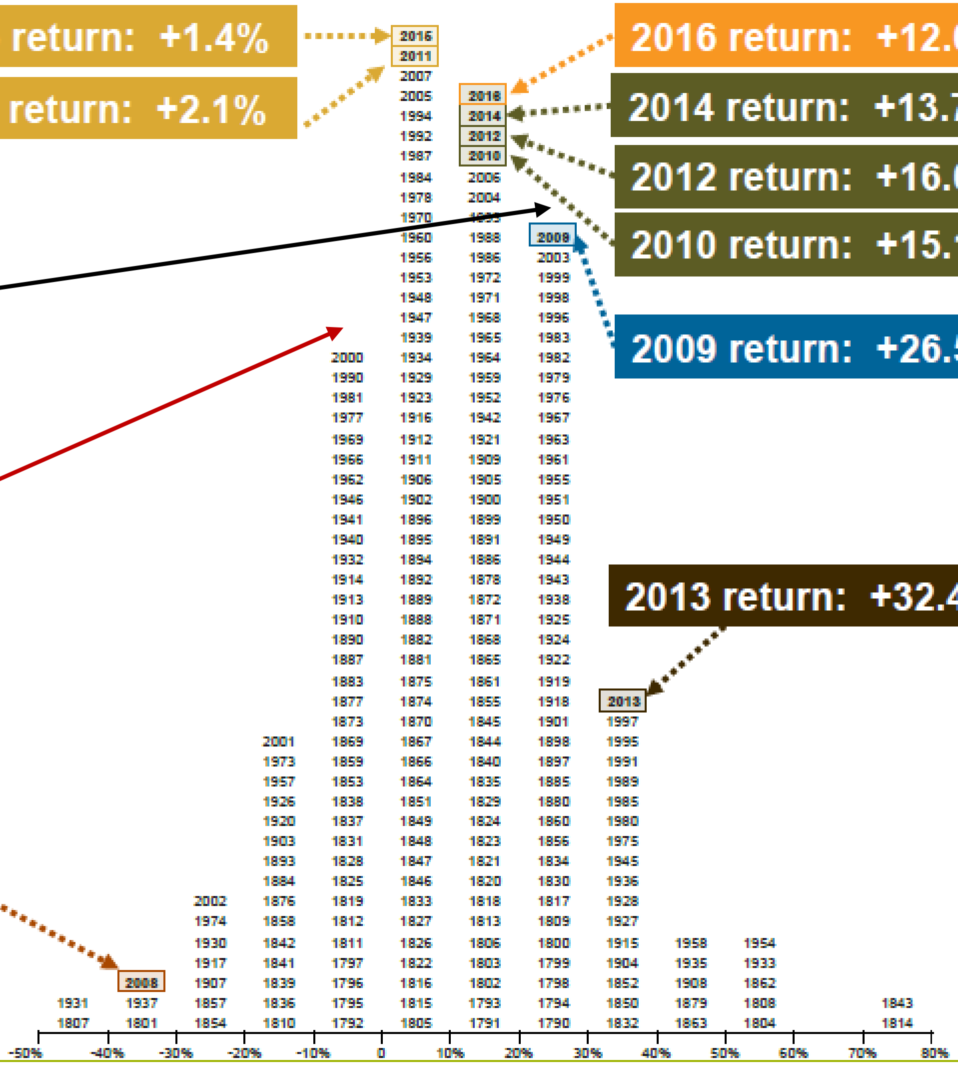
Stock Market Returns by Calendar Year

2016 Performance in Perspective: History of the U.S. Stock Market (228 Years of Returns)



2015 return: +1.4%

2011 return: +2.1%

2016 return: +12.0%

2014 return: +13.7%

2012 return: +16.0%

2010 return: +15.1%

2009 return: +26.5%

S&P 500 Index: +21.8% in 2017

S&P 500 Index: -4.38% in 2018

2013 return: +32.4%

2008 return: -37.0%

Source: Ibbotson

Appendix of Supporting Materials

TFFR Update as of November 30, 2018

Callan's Quarterly Reports of investment performance are available on the following web address:
http://www.nd.gov/rio/SIB/Publications/Callan%20Quarterly%20reports/Invest%20Quarterly.htm

Board members can review monthly manager level performance using the following web address:
http://www.nd.gov/rio/rio_ref/

The SIB has no investment managers on our Watch List at this time, and there are no material legal or legislative proceedings affecting the SIB, excluding RIO's Budget Request for the 2019-21 biennium.

Option 1 – Reinstate 10%; Option 2 – SIB Additional FTE; and Option 3 – TFFR Pension Admin. System Enhancement.

RIO Budget Background

On April 18, 2018, Governor Burgum released budget guidelines for 2019-2021. The Governor is requesting all agencies (including special fund agencies) to adopt the following guidelines:

1) Agencies with an appropriation less than $5 million should submit a base budget with a 5% reduction in ongoing expenditures;
2) Agencies with an appropriation of $5 million or more should submit a base budget with a 10% reduction in ongoing expenditures; and
3) Agencies with 20 or more FTE should submit a base budget with a 5% FTE reduction.

RIO currently has 19 authorized FTE and our appropriation for 2017-19 is $5.3 million. Given that RIO's budget is over $5 million, we were requested to submit a base budget which included a 10% reduction which translates into less FTE in the summary table below. The FTE reduction is assumed due to RIO's budget largely consisting of salaries and benefits (for $4.4 million or 83%) while operating expenses and contingencies have already been reduced to historically low levels. As evidence, RIO's operating expenses declined by 13% over the past 20 years (to less than $863,000 in 2017-19) due to our agency consistently being very cost conscious. RIO's contingency line has also been subject to extreme budget pressures and was reduced by over 36% in the last biennium (to $52,000).

	2017-19 Base Appropriation	Requested 10% Budget Cut	Governor's Base Budget
Salaries and Wages	$ 4,425,570	$ (572,066)	$ 3,853,504
Operating Expenses	$ 862,484	$ 38,061	$ 900,545
Contingencies	$ 52,000	$ -	$ 52,000
Total Special Funds	$ 5,340,054	$ (534,005)	$ 4,806,049
Full-time Equivalent	19.00	-3.00	16.00

RIO management believes our agency has operated in a fiscally conservative manner for many years, while maintaining favorable client satisfaction survey scores (for both TFFR and SIB) despite a 38% increase in TFFR membership (from 15,781 in 1998 to 21,853 in 2017) and 80% increase in assets under management (AUM) since 2013. During the last 20-years, RIO's FTE has only grown by 1 person including two new investment professionals in the last 6-years (which coincided with an 90+% increase in AUM between 2013 and 2018). RIO's overall performance has generally been strong as evidenced by solid client survey scores while investment performance has generally met or exceeded expectations in recent years including above benchmark returns, favorable peer rankings, and a keen focus on optimizing risk adjusted returns. **SIB clients have benefitted from an excellent return on their investment over the last 5-years as evidenced by a 2-for-1 return on investment fees which conservatively translates into over $300 million of incremental client investment income since 2014.**

RIO Budget Submission – Agency Overview

	1	2	3	4	5	6	7	8
	2017-19 Base Budget	2019-21 Base Budget Request (w/10% reduction)	Optional Adjustment #1 "Reinstate 10% Reduction"	Optional Adjustment #2 "Additional FTE"	Additional Governor's Recommendations	Total Governor's Recommendation	Optional Adjustment #3 One-time Request "Pension Admin. System Project"	Total Agency Request
Salaries & Wages	$ 4,425,570	$ 3,860,125	$ 550,194	$ 294,996	$ 304,981	$ 5,010,296	$ 50,000	$ 5,060,296
Operating Expenses	862,484	862,484	-	14,450	12,000	888,934	2,789,000	3,677,934
Contingency	52,000	82,000	-	-	-	82,000	-	82,000
Capital Assets	-	-	-	-	-	-	6,300,000	6,300,000
	$ 5,340,054	$ 4,804,609	$ 550,194	$ 309,446	$ 316,981	$ 5,981,230	$ 9,139,000	$ 15,120,230
FTE Count	19	16	3	1	-	20	-	20

Column 1: RIO's **2017-19 Base Budget** was for **$5.3 million** (including 19 FTE).

Column 2: RIO's **Base Budget** submission of **$4.8 million** reflects a 10% cut in agency expenses as OMB requested.

Column 3: **Option 1** - Given RIO's desire to maintain high quality service levels while noting that SIB investments and TFFR membership are at all-time highs. **The Governor recommended RIO "Reinstate 10% Reduction", which is greatly appreciated.**

Column 4: **Option 2** – RIO requested **$309,446** for one additional FTE (Full Time Equivalent) position to support the continued growth of the SIB investment program. **The Governor recommended approval of one "Additional FTE", which is greatly appreciated.**

Column 5: **Additional Governor Recommendations** – **The Governor included $316,981 of additional compensation and benefits for RIO which is greatly appreciated** particularly given our increasing responsibilities and 0% pay raises for the last two years.

Column 6: Total Governor's Recommendation – Governor's recommendation increased RIO's budget by 12% to $5.98 million.

Column 7: **Option 3** - Given TFFR's pension administration system is 13-years old and our strong desire and need to adopt recent IT system advances, efficiencies and cybersecurity protection levels, we respectfully made a 1-time funding request for **$9.139 million**.

Column 8: RIO's Total Budget Request for 2019-21 including three optional packages is $15.12 million with 20 FTE.

RIO's Budget submission is classified at the SIB and TFFR board level on the following page.

U.S. Economy – Annual GDP Growth Rates

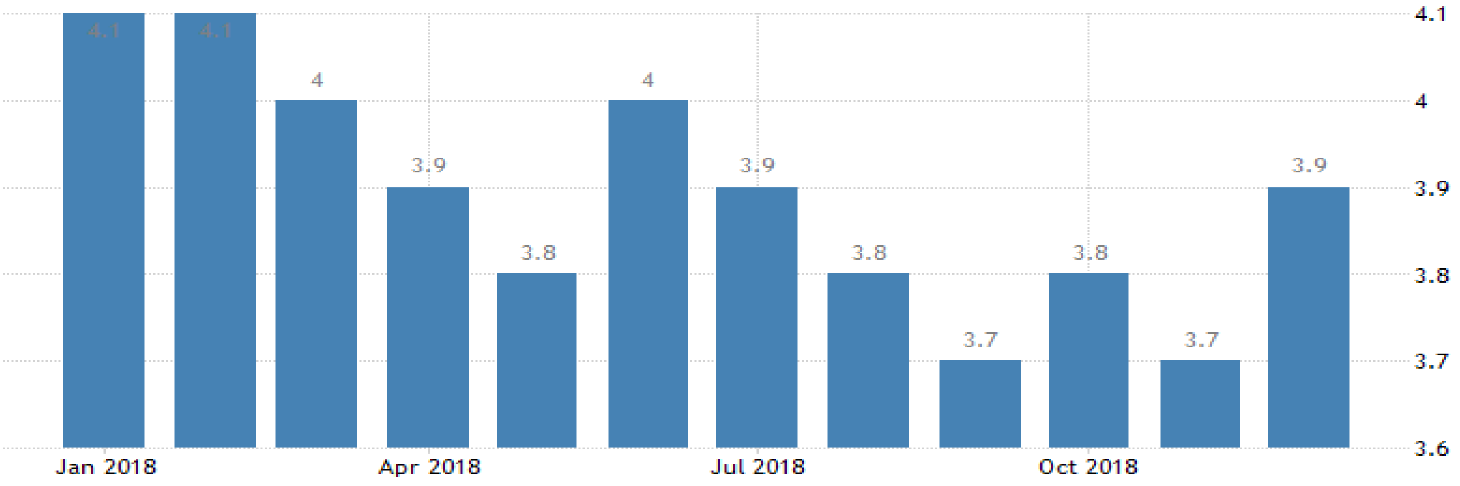
SOURCE: TRADINGECONOMICS.COM | U.S. BUREAU OF ECONOMIC ANALYSIS

US GDP Growth Rates:

The US economy expanded at an annual growth rate of 3.0% in the 3rd quarter of 2018 increasing from 2.6% for the 1st quarter of 2018 and up from 2.9% in the 2nd quarter of 2018. The United States is the world's largest economy. Yet, like in the case of many other developed nations, U.S. growth rates have generally been declining in the last two decades. GDP annual growth rates in the U.S. averaged 3.2% from 1948 until 2017, reaching an all-time high of 13.4% in the 4th quarter of 1950 and a record low of -3.9% in the 2nd quarter of 2009.

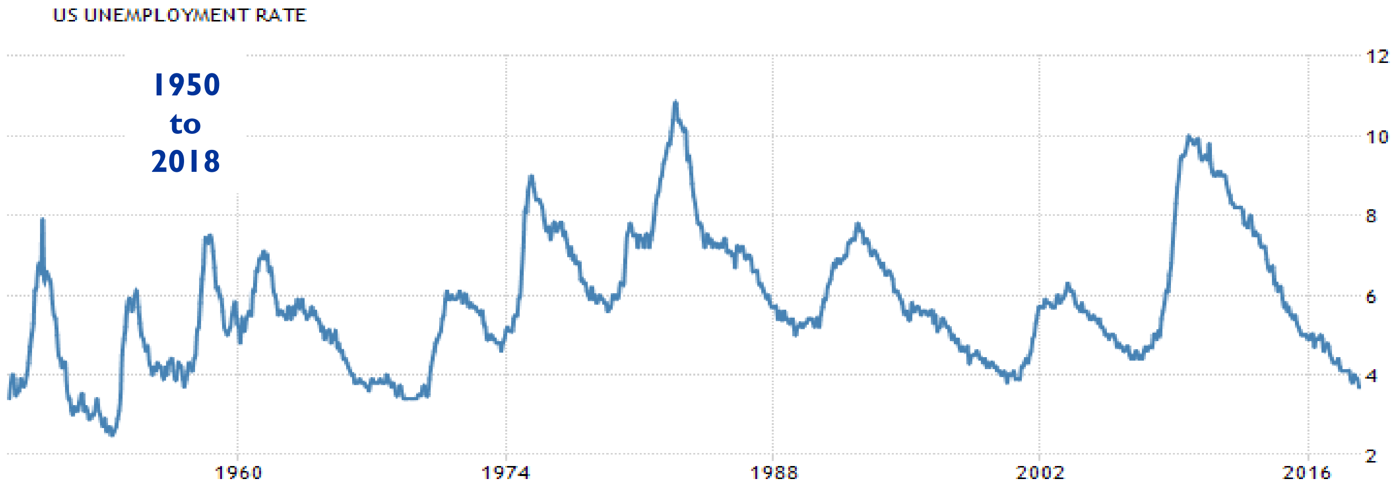
Last updated in July of 2018.

U.S. Unemployment Rates



SOURCE: TRADINGECONOMICS.COM | U.S. BUREAU OF LABOR STATISTICS

The US unemployment rate increased to 3.9% in November of 2018, up from the previous month's 49-year low and above market expectations of 3.7%.



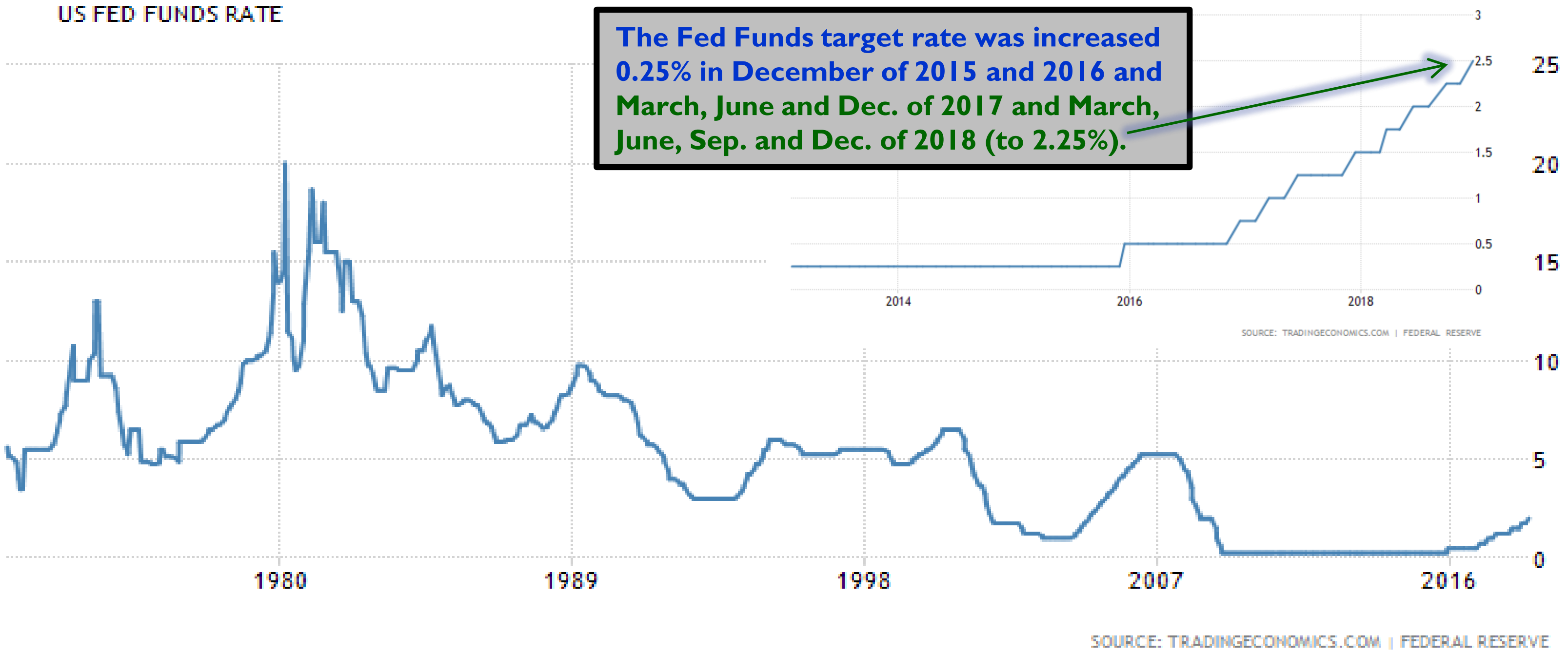
1950 to 2018

SOURCE: TRADINGECONOMICS.COM | U.S. BUREAU OF LABOR STATISTICS

Unemployment Rates in the United States averaged 5.8% from 1948 until 2018, reaching an all time high of 10.8% in November of 1982 and a record low of 2.5% in May of 1953.

U.S. Fed Funds Rate (1971 to 2018)

Background: The **federal funds rate** is the interest rate at which banks lend reserve balances to other banks overnight (on an uncollateralized basis). Banks with surplus balances lend to those in need of larger balances. Reserve balances are held at the Federal Reserve to maintain the banks' reserve requirements. **Changes in the federal funds rate trigger a chain of events that affect other short-term interest rates,** foreign exchange rates, long-term interest rates, the amount of money and credit, and, ultimately, a range of economic variables, including employment, output, and prices of goods and services. The Federal Reserve uses "monetary policy" to influence the availability and cost of money and credit to help promote national economic goals.



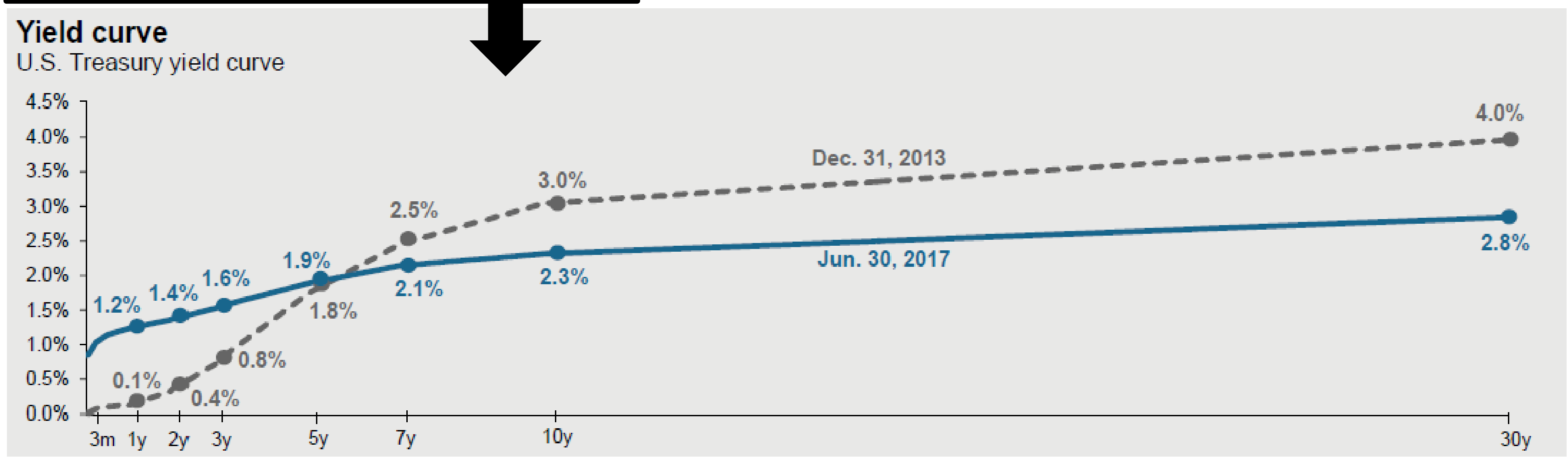
The Fed Funds target rate was increased 0.25% in December of 2015 and 2016 and March, June and Dec. of 2017 and March, June, Sep. and Dec. of 2018 (to 2.25%).

SOURCE: TRADINGECONOMICS.COM | FEDERAL RESERVE

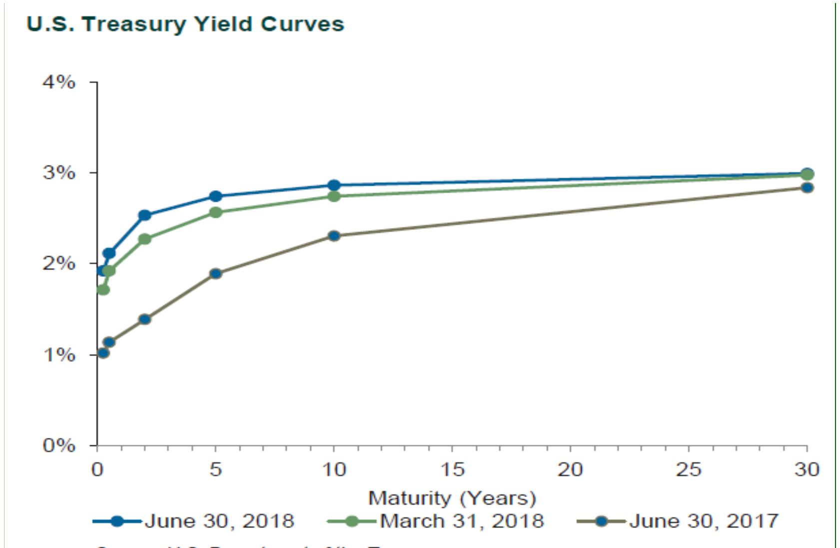
SOURCE: TRADINGECONOMICS.COM | FEDERAL RESERVE

The Federal Reserve raised the target federal funds rate four (4) times in 2018, three (3) times in 2017 and once each in December of 2016 and 2015. Interest Rates in the United States averaged 5.8% from 1971 until 2017, reaching an all time high of 20% percent in March of 1980 and a record low of 0.25% in December of 2008.

UST Yield Curve 12/31/13 vs 6/30/17:

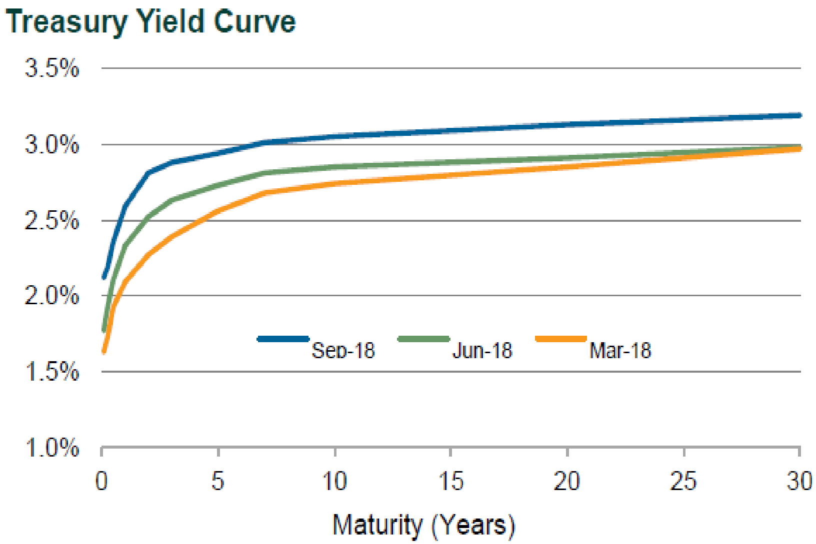


UST Yield Curve Jun-30-2017 to Jun-30-2018:

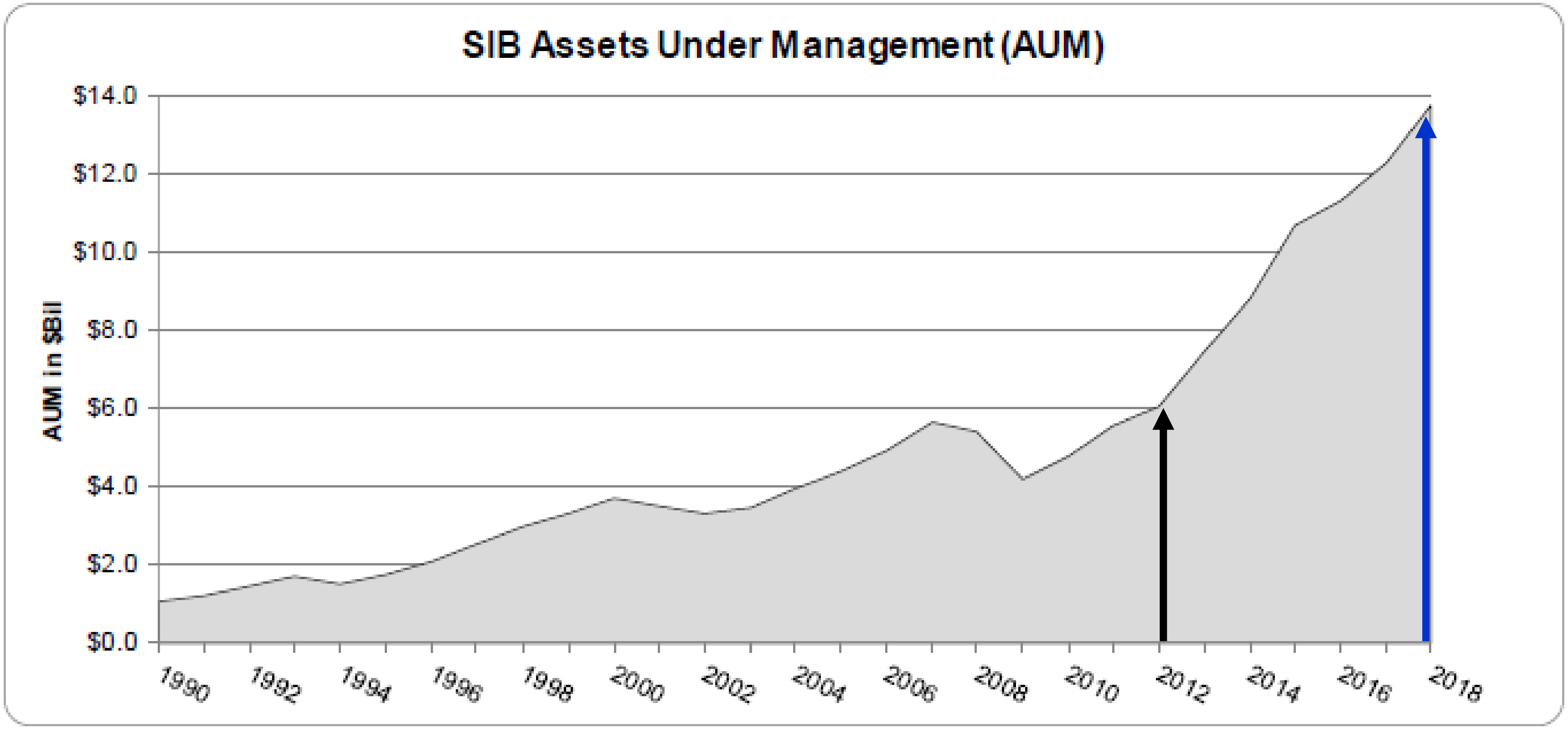


Source: U.S. Department of the Treasury

UST Yield Curve Mar-31-2018 to Sep-30-2018:



SIB Client Investments Have Doubled since 2012

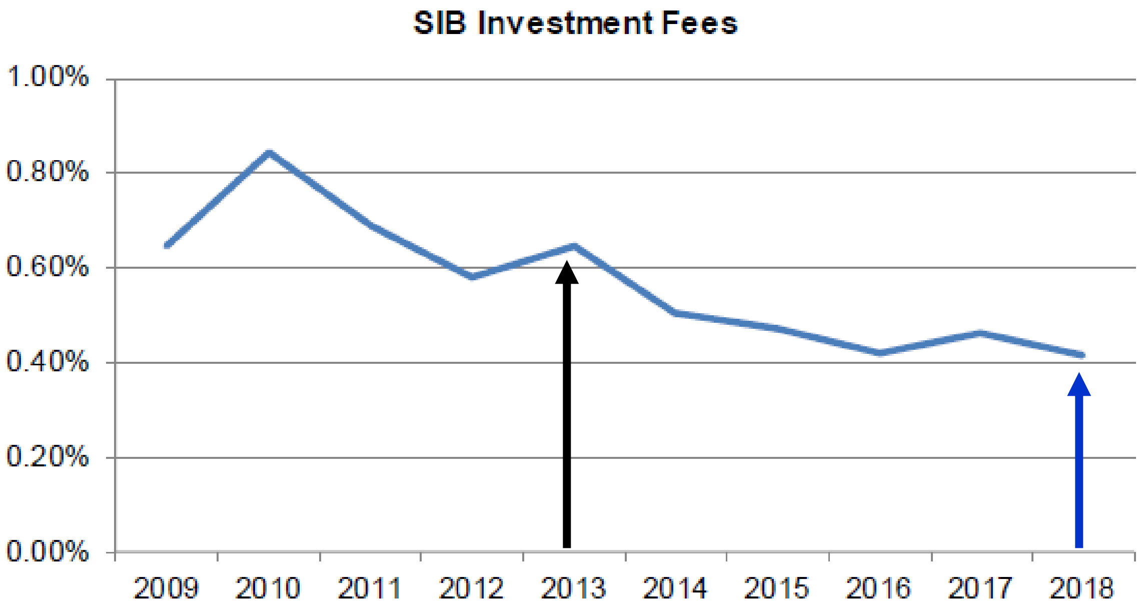


SIB clients Assets Under Management (AUM) have grown from $6 billion in 2012 to over $13 billion in 2018 largely as a result of deposits into the Legacy Fund in addition to reasonable investment earnings growth.

Despite significant growth in client services offered by both the SIB and TFFR programs, SIB and TFFR client satisfaction ratings remain solid at 3.7 for the SIB and 3.8 for TFFR (on a 4.0 grading scale).

SIB Client Investment Fees and Expenses

Investment fees have declined from 0.65% in fiscal 2013 to 0.42% in fiscal 2018 (as a % of AUM).



The SIB and RIO work to keep investment fees at or below 0.50% per year, while seeking to identify investment firms which beat their performance benchmarks by 0.50% or more (after all expenses) over the long-term.

If the SIB and RIO are successful in attaining both of the above goals, our SIB clients are effectively earning a minimum 2-for-1 return on their investment fee dollars (in the form of better returns over stated benchmarks).

The SIB and RIO were successful in attaining the above goals for nearly all of our clients in fiscal 2018 such that the use of active management generated $100 million of incremental income for our clients (in fiscal 2018).

North Dakota
Teachers' Fund For Retirement

MEMORANDUM

TO: **TFFR Board**

FROM: **Fay Kopp**

DATE: **January 17, 2019**

SUBJ: **TFFR Employer Reporting Review Update**

In November 2018, RIO's legal counsel, Anders Odegaard advised Audit Services they should no longer be communicating its findings from employer audits to TFFR participating employers. He recommended that instead, Audit Services should forward its findings to Retirement Services to communicate directly with employers.

Consequently, Retirement Services will now take over the communication and follow up functions for employer reporting reviews. Additionally Retirement Services plans to begin requesting school boards and administrators to acknowledge acceptance of the report, and provide a written explanation of how they will comply with findings and recommendations. In the future, Retirement Services will also present employer reporting review reports for acceptance by the TFFR Board.

Attached is the process Retirement and Audit Services have established relating to TFFR Employer Reporting Reviews.

Board information only. No Board action is requested.

TFFR EMPLOYER REPORTING REVIEWS

Audit Services

1) Send audit notification and questionnaire to Employer for Audit Services to conduct review of TFFR employer reporting for selected members for two-year period.
2) Review Employer documentation and member eligibility, eligible salary, service credit of sample.
3) Complete schedules, member account changes to salaries/contributions, service hours, payroll reconciliations, and related reports.
4) Provide draft Audit Services report, including findings and recommendations, to Retirement Services (CRO and RPM) for initial review and discussion.
5) Issue final Audit Services report on TFFR Employer Reporting Review to Retirement Services. Request response from Retirement Services.
6) Audit Services report and Retirement Services response will be reported to SIB Audit Committee on a quarterly basis.

Note: Effective December 1, 2018, Audit Services will no longer issue audit report, invoices, or refunds to employers resulting from review of TFFR reporting.

Retirement Services

1) Review Audit Services report on TFFR Employer Reporting Review. Determine if additional years will be reviewed by Retirement Services.
2) Provide written response to findings and recommendations included in Audit Services report.
3) Contact Employer/Business Manager to discuss findings, recommendations, and future actions.
4) Make account corrections, prepare and send invoice or refund to Employer/Business Manager, and prepare and send account correction letter to members.
5) Prepare TFFR Employer Reporting Review report.
6) Issue TFFR Employer Reporting Review report and cover letter to Employer (Superintendent and Governing Body President).
7) Request Employer to provide written acknowledgement that Employer has accepted report and will comply with findings and recommendations OR has the right to appeal to TFFR Board.
8) Monitor receipt of Employer acknowledgement, and follow up with Employer as needed.
9) TFFR Employer Reporting Review reports will be presented for acceptance by TFFR Board on a quarterly basis.

Employer (Superintendent and Governing Body/School Board President)

1) Review TFFR Employer Reporting Review report from Retirement Services.
2) Add TFFR Employer Reporting Review report to Governing Body / School Board Meeting agenda.
3) Employer to Accept or reject TFFR Employer Reporting Review report.
4) If accepted, Supt and Governing Body President sign acknowledgement letter and provide explanation of how Employer will comply with findings and recommendations.
5) If rejected, Employer files appeal with TFFR Board.
6) Follow up with TFFR office and Employer staff as needed. 1.10.19

RETIREMENT AND INVESTMENT OFFICE
AUDIT SERVICES
2018-2019 2nd Quarter Audit Activities Report
September 1, 2018 – December 31, 2018

The audit objective of Audit Services is twofold: first, to provide comprehensive, practical audit coverage of the Retirement and Investment Office (RIO) programs; second, to assist RIO management and the State Investment Board (SIB) by conducting special reviews or audits.

Audit coverage is based on the July 1, 2018 through June 30, 2019 work plan approved by the SIB Audit Committee. The audit activities undertaken are consistent with the Audit Services charter and goals, and the goals of RIO. To the extent possible, our audits are being carried out in accordance with the International Standards for the Professional Practice of Internal Auditing. Audit effort is being directed to the needs of RIO, the concerns of management, and the SIB Audit Committee.

Retirement Program Audit Activities

- **TFFR Employer Salary, Service Hours, Eligibility Review**

We examine employer reporting to the Teachers' Fund for Retirement (TFFR) to determine whether retirement salaries and contributions reported for members of TFFR are in compliance with the definition of salary as it appears in NDCC 15-39.1-04(10). Other reporting procedures reviewed during the audit process are calculation of service hours and eligibility for TFFR membership. A written report is issued after each review is completed.

Status of TFFR Employer Audits as of December 31, 2018:

  - Three (3) employer audits had been completed.
  - Three (3) employer audits were in progress.

NOTE: Procedures for the TFFR Employer Audit Program were changed in November 2018. Audit Services will now be issuing reports to Retirement Services, not the employers. Retirement Services will be responsible for issuing reports to the employers and giving a written response on how, if any, findings and recommendations are being addressed. Retirement Services and Audit Services worked together on creating the new procedures.

- **Cost Benefit Effective Benefit Payment Audit**

A review of TFFR benefit recipients is completed to determine that they received their retirement benefits in a cost effective and timely manner. For sample members, Audit Services reviewed their progression through the presumptive retirement process and benefit recalculation process to determine that procedures were completed in a timely manner. The benefit paid was recalculated for at least one retiree from each retirement option represented in the sample. Comment cards received from members who presentations were reviewed for a year. Lastly, the TFFR budget and investment cost per member was reviewed.

The substantive testing has been completed. Audit Services is now analyzing the data to complete the audit report.

- **Data Analytics**

Audit Services and RIO's Information Technology Division has been working with North Dakota Information Technology Department to develop data analytics to help streamline the TFFR Employer Salary, Service Hours, Eligibility Review process. Multiple meetings have been held, and the development of data analytics has started.

- **External Audit Support**

Audit Services provided support to our external audit partners, CliftonLarsonAllen (CLA), during the GASB 68 Census Data Audits. CLA GASB 68 Census Data Audit work concluded in October. Audit Services worked with the external audit partners on reconciling GASB 68 census testing data.

Investment Audit Activities

- **Executive Limitation Audit**

On an annual basis, Audit Services reviews the Executive Director/CIO's level of compliance with SIB Governance Manual Executive Limitation Policies A- 1 through A-11. Executive Limitation A-2 references staff relations. The staff participated in the ND employee staff survey in October 2018. The Executive Limitations Audit was started in December 2018.

- **Investment Due Diligence**

An audit about the ongoing due diligence that is being performed on the investment managers that have been hired by the SIB was developed. Audit Services has not performed an investment due diligence audit so discussions with investment staff and research went into the development of this audit. This audit includes reviewing the procedures and documentation that is being done on the investment managers by RIO's staff. A sample of investment managers was selected and documentation pertaining to the ongoing investment due diligence was reviewed. This audit is currently in progress.

Administrative Activities

Audit staff attends monthly RIO staff meetings, and the Supervisor of Audit Services attends monthly RIO manager's meetings. The Supervisor of Audit Services attended two SIB meeting, one Securities Litigation meeting, one TFFR Board meeting, and audit staff were in attendance for the one SIB Audit Committee meeting. Internal auditing staff is participating in RIO's CAT (communication and teamwork) committee focused on improving communication and teamwork in the RIO office.

Professional Development/CE/General Education

Audit Services continued its participation with the Institute of Internal Auditors (IIA) Central NoDak Chapter by attending the November and December monthly meetings. Internal auditor staff also attended the fall IIA conference, topics covered fraud and selling audit ideas.

Audit staff also completed cybersecurity awareness training administered through RIO's Information Technology division. The Supervisor of Audit Services started pursing a Master's in Business Administration with a concentration in Public Administration in September 2018 and completed the following courses: Organizational Behavior, Human Resource Management, and Project Management.

NORTH DAKOTA RETIREMENT AND INVESTMENT OFFICE
INTERNAL AUDIT SERVICES

TFFR EMPLOYER REVIEW OF SALARIES, SERVICE HOURS, AND ELIGIBITY OF TEACHERS REPORTED

JULY 1, 2018 TO JUNE 30, 2019

✕ **Reviews Pending - (3)**
& **Reviews in Progress - (0)**
✓ **Reviews Completed - (3)**

Reviews Carried Over From 2017/18 - (6)
Review Notifications Sent 2017/18 - (0)

			EMPLOYER	FISCAL YEARS	TOTAL MEMBERS	REPORT DATE	EMPLOYER CONTRIB'S DR(CR)	MEMBER SALARY ADJUSTED	MEMBER SERVICE CREDIT ADJUSTED	STATUS
1	✓	DT	Alexander	6/30/2015, 16	23	10/25/2018	(790.21)	3	0	**Four findings noted.** (1) Did not actively monitor hours for two retired teachers who returned to teach; (2) reported ineligible mileage; (3) reported summer salary in the wrong fiscal year; and (4) no written agreements for summer salary.
2	✓	DT	Garrison	6/30/2015, 16	44	10/29/2018	$0.00	0	0	**One finding noted.** Summer agreement was not issued for one member.
3	✓	DT	Lidgerwood	6/30/2015, 16	45	9/13/2018	$0.00	0	0	**One finding noted.** The employer did not actively monitor the service hours for one retiree who had returned to covered employment to ensure that the maximum allowable hours were not exceeded. Actual service hours were not reported to TFFR for the retiree.
4	✕	DT	New England	6/30/2016, 17	26					Audit information received and is pending.
5	✕	DT	Warwick NIC Review	6/30/2017	31					Audit information received and is pending.
6	✕	DT	Wilton	6/30/2016, 17	32					Audit information received and is pending.
				Totals	201		($790.21)	3	0	

NORTH DAKOTA RETIREMENT AND INVESTMENT OFFICE
AUDIT SERVICES DIVISION
FISCAL YEAR 2018 -2019

	FY 2018 1st QTR	FY 2018 2nd QTR	FY 2019 3rd QTR	FY 2019 4th QTR	FY 2019 TOTAL
Audit Activities					
Retirement Program Audits:					
TFFR Employer Audit Program					335
Alexander Public School District	88	28.50			117
Garrison Public School District	37	21.50			59
Lidgerwood Public School District	47	0.00			47
Scranton Public School District	27	1.50			29
General Employer Audits	8				8
Audit Peer Reviews/TFFR Meeting(s)/Audit Planning/Audit Notifications	6	70.00			76
TFFR Cost Effective Benefit Payment Audit	2	161.50			164
TFFR Data Analytics		20.00			20
TFFR File Maintenance Audit(s)					0
Annual Salary Verification Project					0
Audit Continuous Improvement Project - Employer Audit Program - Census Data Audit File	13				13
Agency Administrative and Investment Audits:					
Executive Limitations Audit	7	11.00			18
Investment Due Diligence		53.00			53
Risk Assessment	206	7.25			213
RIO External Auditor Assistance	23	4.00			27
Administrative Activities					
Administrative - Staff Mtgs, Time Reports, Email, Records Retention, General Reporting	180	221.00			401
Audit Committee/SIB/TFFR Attendance and Preparation	186	188.50			374
Professional Development/CE/General Education	1	34.25			35
Annual Leave, Sick Leave, and Holidays	209	218.25			427
Quarterly Total:	**1040**	**1040**	**0.00**	**0.00**	**2080**

Total Hours for 2018-2019	4,160
D. Thorsen Total Hours 2018-2019	2,080
S. Sauter Total Hours 2018-2019	2080

TFFR Ends
Annual Review
Year Ended June 30, 2018

The information provided below indicates that the TFFR ends policies formally adopted by the TFFR Board and accepted by the SIB are being implemented.

Ends Policy: **Membership Data and Contributions**

Ends: Ensure the security and accuracy of the members' permanent records and the collection of member and employer contributions from every governmental body employing a teacher.

- **Member and Employer Information**

  The CPAS pension administration software and FileNet document management software has been used for thirteen years. The CPAS pension administration software version we are using is browser based and is reaching the end of its life cycle. We are exploring options to replace or upgrade the TFFR pension software with a secure web based application to improve efficiencies and functionality. TFFR Member Online Services went into production in February 2018. This secure application allows TFFR members to only view their personal pension account information. Security of TFFR data is a high priority and staff annually completes cyber security training. In FY18, an ITD specialist also presented a very helpful onsite cyber security presentation to RIO staff.

- **Collections and Payments**

  Collected member and employer contributions totaling $166.6 million from 214 employers and $2.2 million from members for the purchase of service credit.

  Paid out $202.4 million in pension benefits and $5.6 million in refunds and rollovers totaling $208.0 million for the year.

  About 85% of employers electronically report contributions to TFFR. This comprises over 98% of the active membership.

  As of June 30, 2018, 182 employers are reporting using TFFR Employer Online Services.

  Assessed 16 reporting penalties and did not withhold foundation payments from any school districts. TFFR waived 4 of the 16 penalties. Employer reporting penalties include late reporting of contributions and failure to provide documentation in a timely manner (e.g. new member forms, return to teach forms, employer compliance audit documentation.)

  3 employers modified employer payment plan model election.

- **Employer Summary Report and Member Statements**

  Mailed 13,278 annual benefits statements to non-retired members in August
  Mailed 8,507 annual statements to retired members in December
  Mailed FY2018 Employer Summary Report to each employer in August 2018

- **Employer Outreach Programs & Communications**

  Met with school board members, business managers, and software vendors at the 2017 School Board and School Business Manager Association Annual Conference.

  Presented TFFR employer information to 101 school district business managers at one statewide workshop.

  Completed two new business manager workshops attended by Edgeley, Kidder Co School, Wilmac Special Education, Glen Ullin, Northwood, TGU, Wishek, and Parshall.

  GASB 68 2017 data updated and added to website.

  Briefly employer newsletter (4 publications sent electronically)

  Employer online training library – added Employer Reporting Models webcast.

Ends Policy: **Member Services**

Ends: Provide direct services and public information to members of TFFR.

- **Outreach Program Statistics**

  1,047 attended outreach programs (plus convention participants)
  Retirement Services staff traveled 3,216 miles

- **Retirement Education Workshops**

  80 attended
  2 locations – Bismarck & Grand Forks

  Retirement Education Workshops are generally held at two sites each year in July and rotate between Bismarck, Minot, Fargo, and Grand Forks. Additional workshops will be added if requested by an employer and minimum attendance can be met.

- **Retirement 101 Workshops**

  n/a

- **Group Counseling Sessions**

  366 attended
  6 locations – Minot, Grand Forks, Rugby, West Fargo, Dickinson, and Bismarck

- **Local Office Counseling –** 441 members

- **Group Presentations**

  160 attended

  NDRTA Convention
  NDSBA
  Devils Lake In-Service
  Hettinger In-Service

- **Conferences and Conventions**

  ND Retired Teachers Convention – Fargo
  ND School Board Convention – Bismarck
  ND Career and Technical Education Convention – Bismarck
  NDCEL Annual Conference – Bismarck
  Mandan In-Service

- **Member Communications**

  Report Card non-retired newsletter (2 publications)
  Retirement Today retiree newsletter (2 publications)
  Updated retirement forms, and Member Handbook
  Updated TFFR Fast Facts handout
  TFFR Member Online went live
  Updated mastheads and changed to full color member newsletters
  Implemented electronic delivery of active member newsletters via employer email

- **NDRIO Website**

  NDRIO web site was visited by 21,325 users a total of 36,330 times. The average length of each visit was just under three minutes. The webcasts in the training library were viewed 184 times in FY18.

- **TFFR Member Online**

  As of June 30, 2018, 881 members have signed up for TFFR Member Online Services.

Ends Policy: **Account Claims**

Ends: Ensure the payment of claims to members of TFFR.

- **Annuity Payments**

  Distributed $202.4 million in pension benefits to 8,743 retired members and beneficiaries. Of the total, only 3 payments are still mailed by check and the remainder deposited via electronic funds transfer.

- **Monthly Payroll Deductions** (July 1, 2018 payroll – total 8,719)

Federal tax withholding	6,606	76%
ND state tax withholding	5,503	63%
PERS health insurance	657	8%
PERS dental insurance	396	5%
PERS vision insurance	195	2%
PERS life insurance	27	<1%

- **Refunds, Rollovers & Transfers**

  Distributed refund and rollover payments of $5.6 million to 228 participants during the fiscal year. Approximately 39% of the refunding members rolled over their refund payment to an IRA or another eligible plan.

- **Processed Claims for Benefits**

Refunds	138
Rollovers	90
Retirements	398
Disabilities	3
Survivor annuitants	6
Continuing annuitants	51

- **Member Account Activity**

New members	879
Deaths	226
Pop ups	40
Purchase requests	174
Retiree Payroll Notices	1,400

Ends Policy: **Trust Fund Evaluation/Monitoring**

Ends: Ensure actuarial consulting and accounting services are provided to the retirement program. The TFFR Board of Trustees will select the independent actuary for consulting and actuarial purposes and direct a contract to be executed.

- **Actuarial Services**

The annual actuarial valuation for July 1, 2018 was presented to the TFFR Board by Segal on October 25, 2018.

- **External Audit**

An unqualified opinion was issued by independent auditors, Clifton Larson Allen, LLP, regarding RIO’s financial statements for the year ending June 30, 2018. Clifton Larson Allen, LLP presented the report to the SIB Audit Committee on November 15, 2018.

- **Internal Audit**

The annual audit activities report was presented to the TFFR Board on July 26, 2018. The report included information about TFFR employer compliance audits, benefit payments audit, file maintenance audit, and the salary verification project.

- **Other**

Received Certificate of Achievement in Financial Reporting from GFOA for June 30, 2017, Annual Financial Report.

Received 2018 recognition award for pension plan administration from the Public Pension Coordinating Council.

TFFR Retirement Statistics

>Participation in Outreach Programs

>Service Purchase Statistics

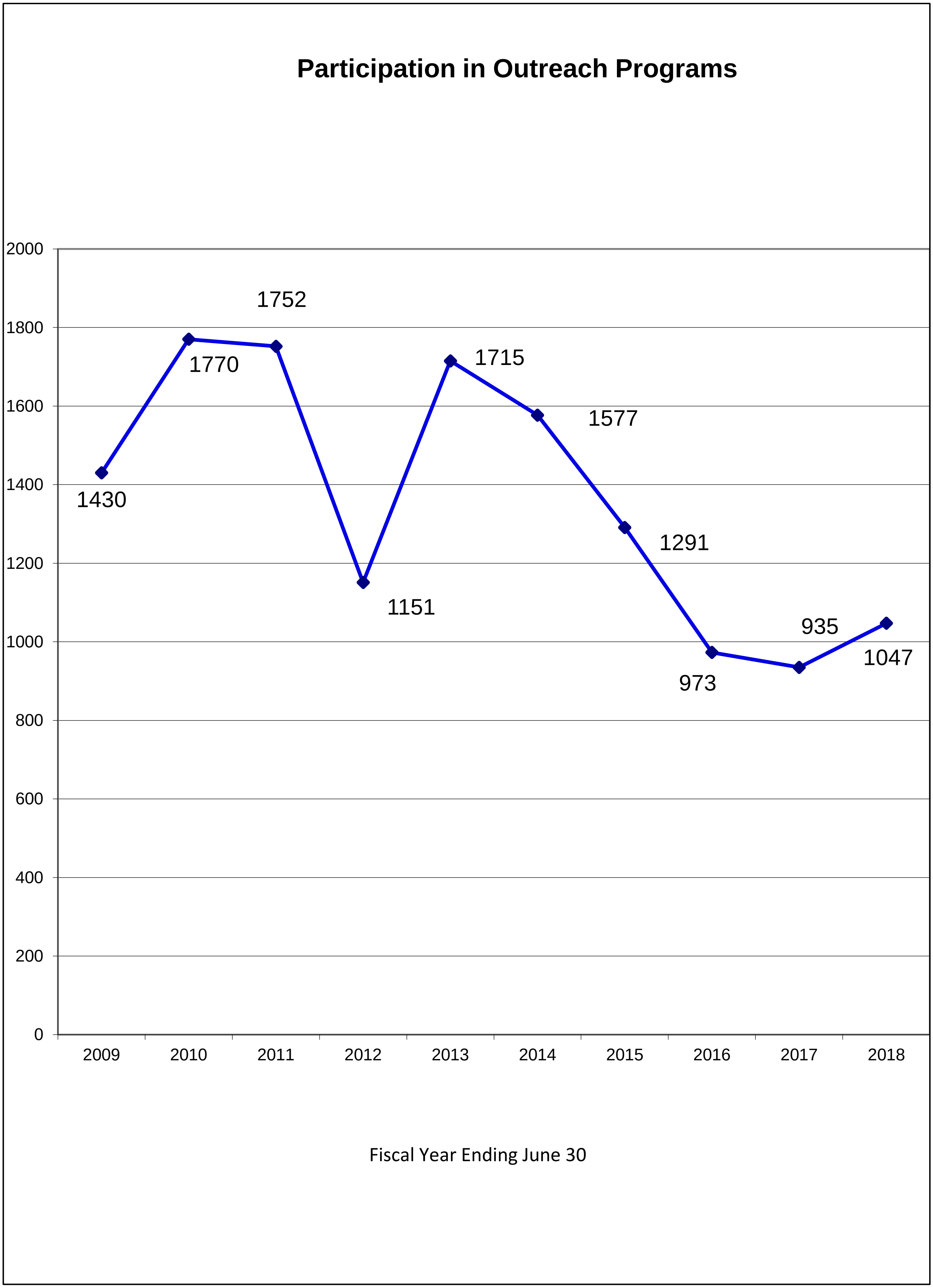
>Active Membership Tier Statistics

>Service Retiree History & Option Usage

>Retiree Statistics

>Disability Retirements

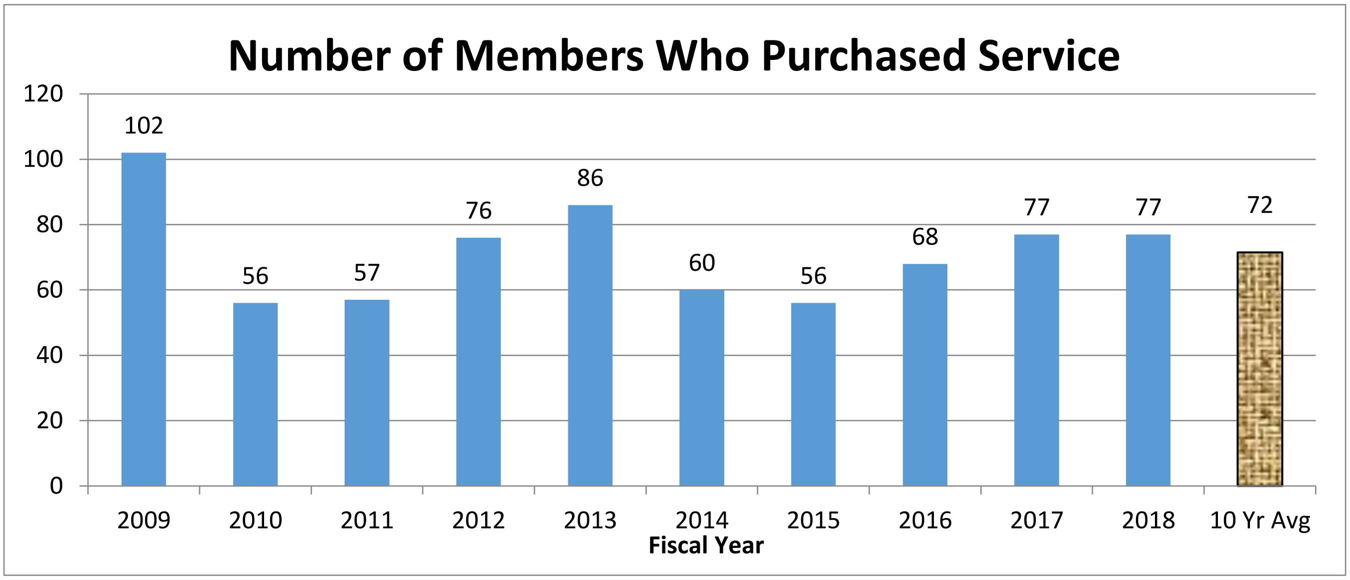
>Employer History & Current Employer Payment Model Statistics

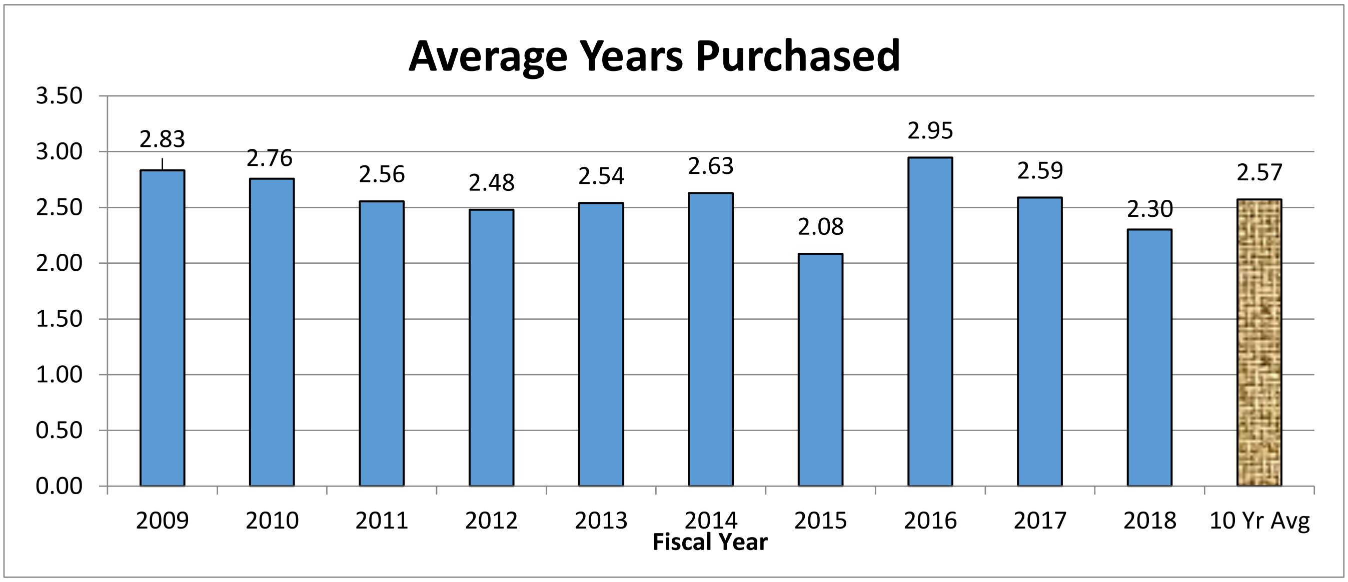


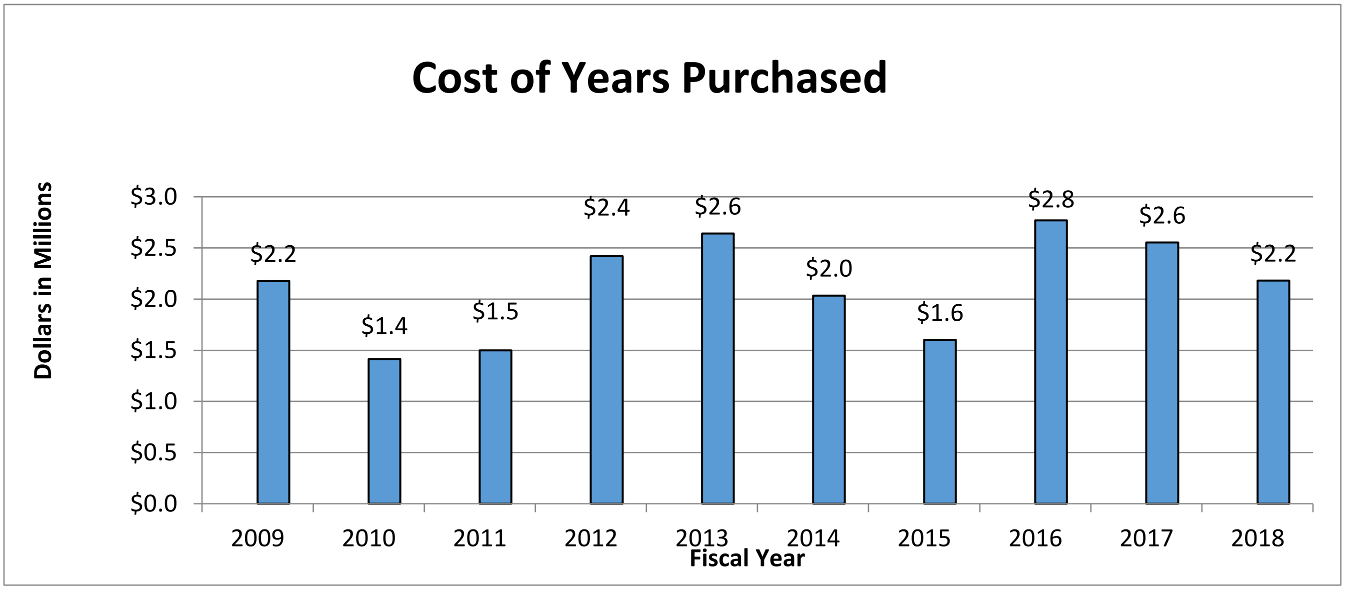
Participation in Outreach Programs

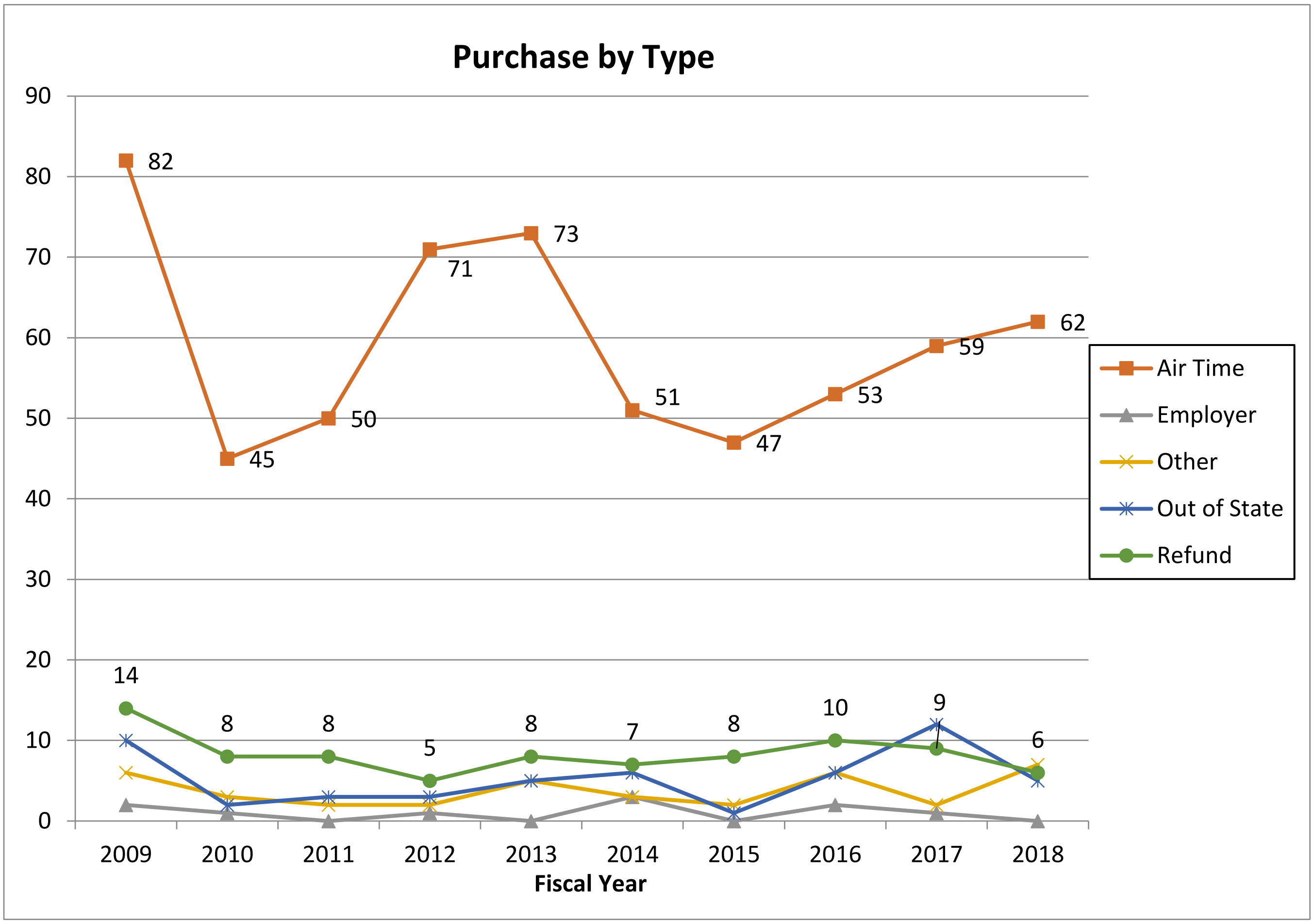
Fiscal Year Ending June 30

Service Purchase Statistics – 2018








Purchase by Type
90
80
70
60
50
40
30
20
10
0
82
45
50
71
73
51
47
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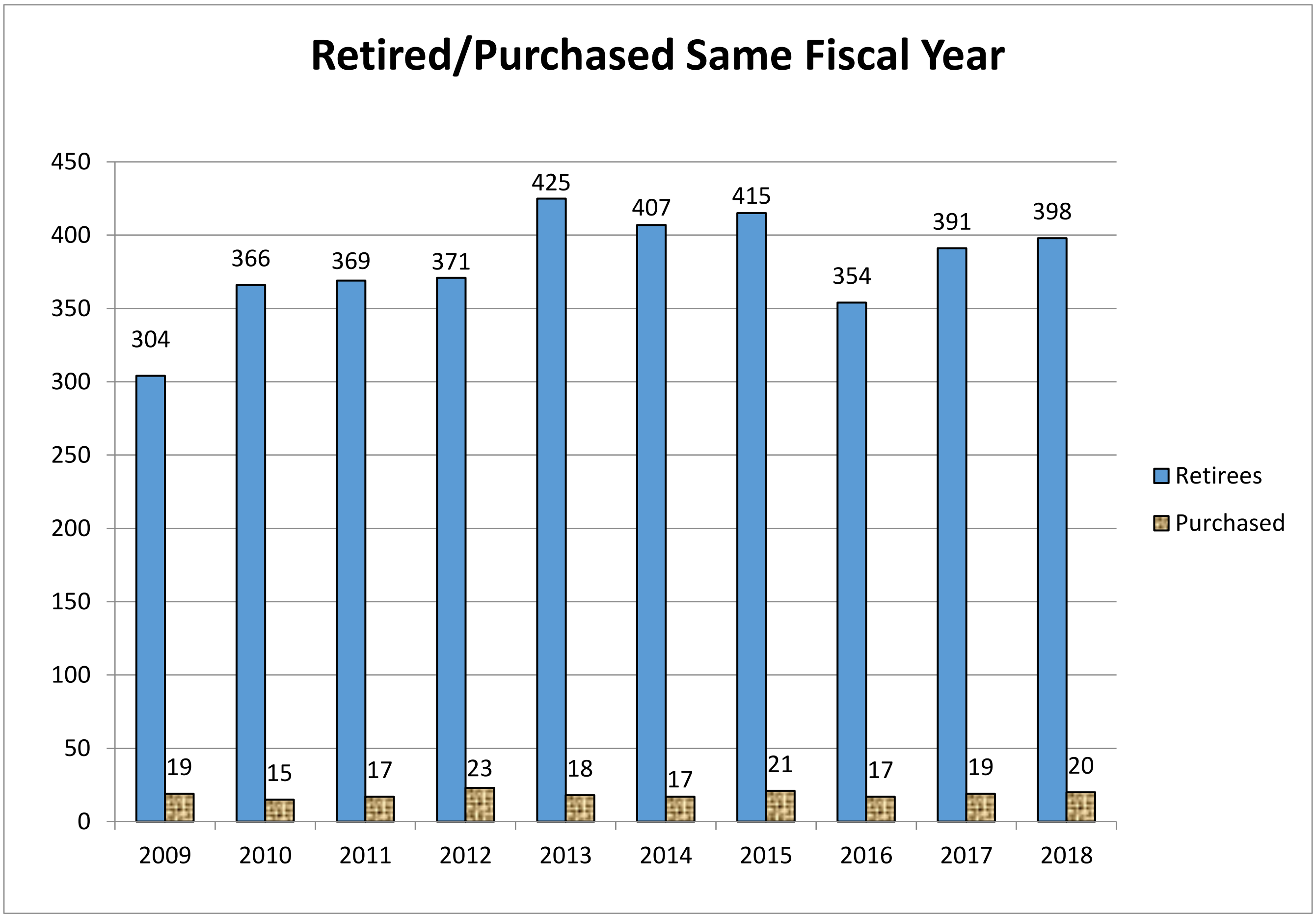
59
62
14
8
8
5
8
7
8
10
9
6
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Fiscal Year
Air Time
Employer
Other
Out of State
Refund


Retired/Purchased Same Fiscal Year
450
400
350
300
250
200
150
100
50
0
304
366
369
371
425
407
415
354
391
398
19
15
17
23
18
17
21
17
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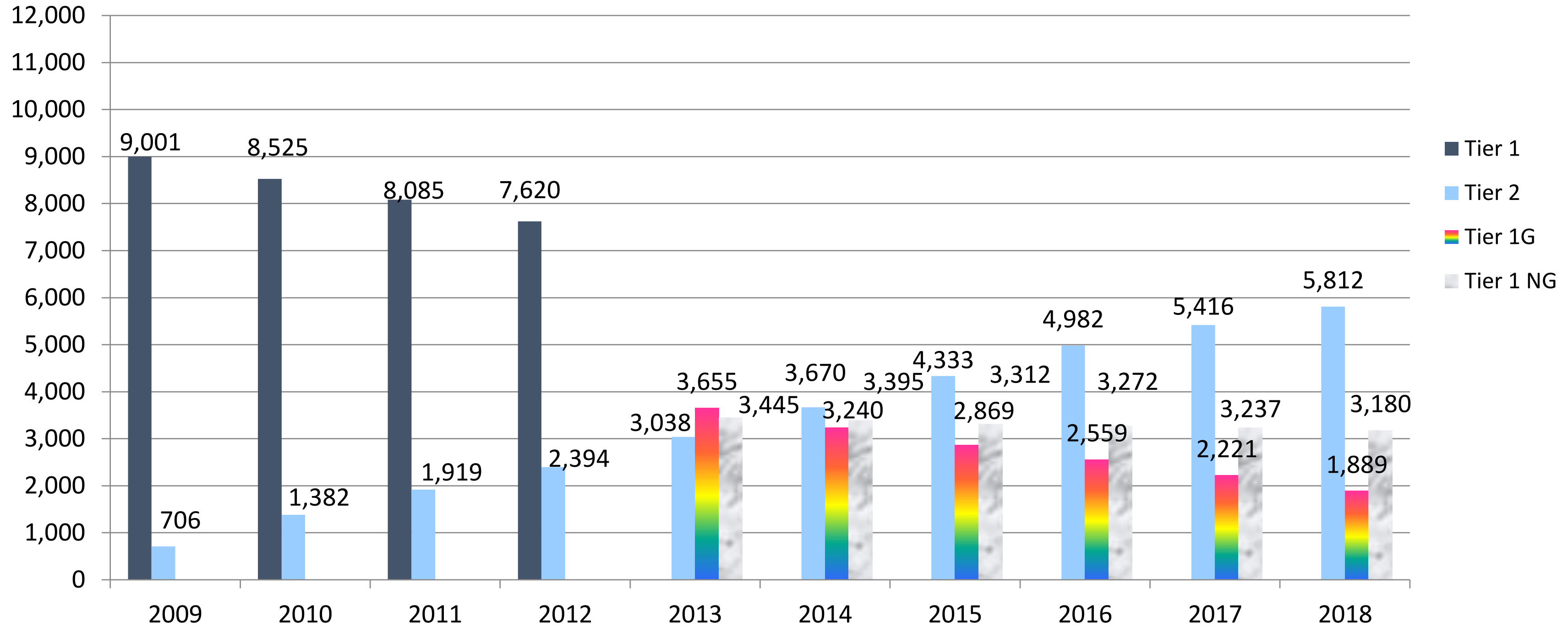
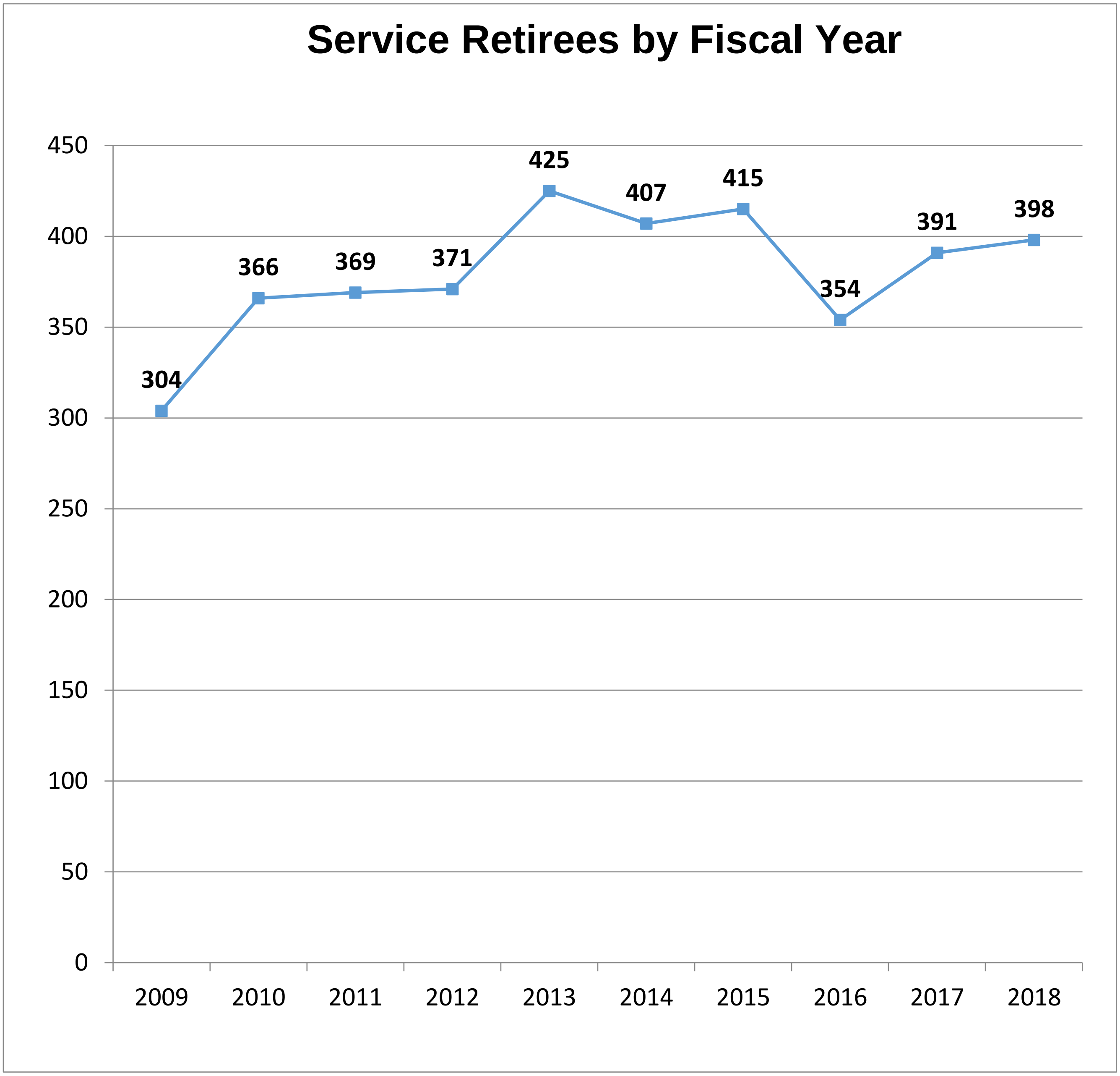
Retirees
Purchased

ACTIVE MEMBERSHIP
TIER STATISTICS



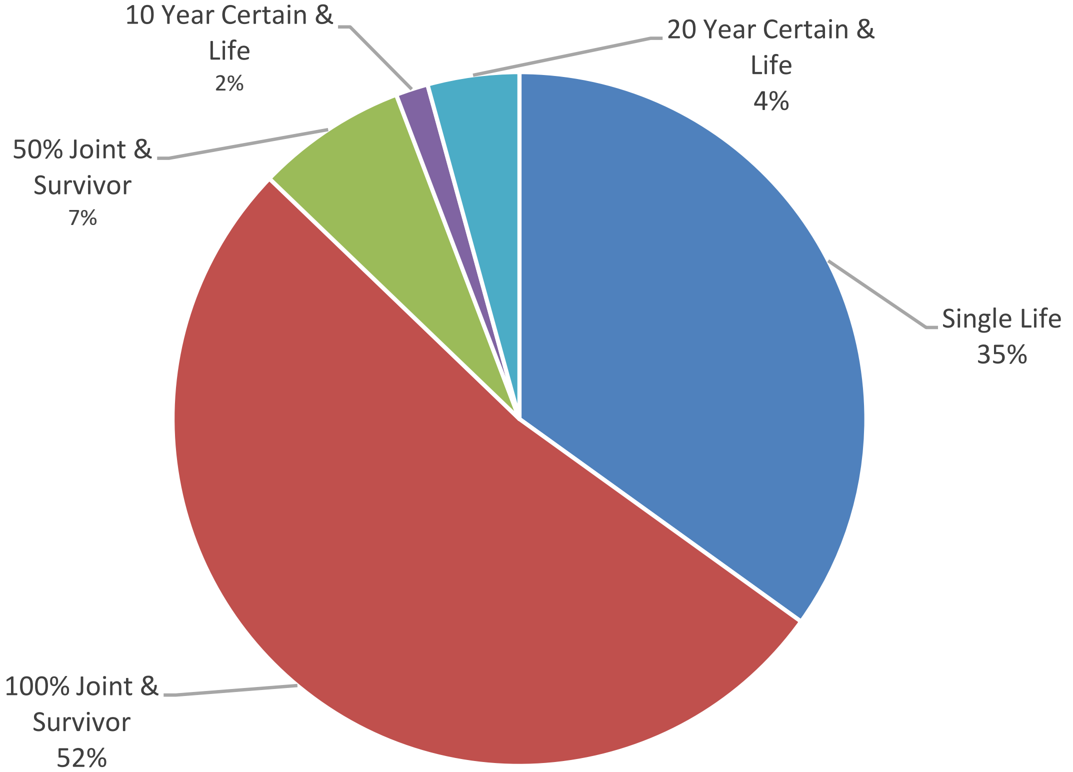


Service Retirees by Fiscal Year

Service Retirement Options

2017-18

Retirement Option	**Number**
Single Life	139
100% Joint & Survivor	208
50% Joint & Survivor	28
10 Year Certain & Life	6
20 Year Certain & Life	17
Total	**398**



Note: Of total, 0 members (0%) selected level income option.

Of total, 18 members (5%) selected partial lump sum option.

TFFR Retiree Statistics

October 2018

Data Selection

- 8,743 retired members and beneficiaries as of July 2018 based on data from the valuation file.

- Selected various categories of retiree data and grouped data 3 ways

TFFR Retiree
Statistics by Fiscal Year

Fiscal Year of Retirement Ending June 30	Avg Monthly Pension	Avg Annual Salary	Avg Service Credit	Avg Retirement Age of Member	Avg Current Age of Recipient	Number of Retirees
pre-1979	$ 499	$ 8,308	25.0	59.3	88.5	73
1980	$ 600	$ 12,315	28.3	59.8	93.1	13
1981	$ 585	$ 13,918	26.1	59.2	95.7	18
1982	$ 661	$ 18,984	26.8	60.8	91.8	18
1983	$ 420	$ 10,459	21.6	57.7	89.4	8
1984	$ 808	$ 20,106	29.5	61.8	93.7	44
1985	$ 900	$ 23,486	30.3	60.2	90.1	17
1986	$ 958	$ 25,230	31.4	61.2	91.9	61
1987	$ 845	$ 24,495	26.7	59.8	89.6	18
1988	$ 1,023	$ 26,101	28.8	60.5	89.4	87
1989	$ 983	$ 28,288	27.5	58.8	87.0	25
1990	$ 1,109	$ 27,457	29.7	59.2	86.4	190
1991	$ 990	$ 27,821	26.1	59.7	85.7	78
1992	$ 1,203	$ 30,938	30.1	58.9	83.8	151
1993	$ 1,131	$ 32,638	25.4	58.3	82.2	66
1994	$ 1,280	$ 32,023	28.1	59.5	83.8	235
1995	$ 1,277	$ 32,910	27.9	58.9	80.9	177
1996	$ 1,254	$ 32,865	27.2	58.5	80.2	149
1997	$ 817	$ 27,112	19.8	58.0	79.3	72
1998	$ 1,504	$ 34,495	29.1	58.9	79.1	314
1999	$ 1,103	$ 33,356	21.3	58.5	77.4	89
2000	$ 1,685	$ 37,806	29.2	58.7	77.1	392
2001	$ 1,381	$ 38,009	23.1	57.3	74.4	80
2002	$ 1,742	$ 39,354	28.3	58.3	74.6	478
2003	$ 1,731	$ 40,629	27.2	58.2	73.3	276
2004	$ 1,798	$ 41,537	27.7	58.3	72.5	342
2005	$ 1,920	$ 43,249	27.7	58.5	71.7	347
2006	$ 1,934	$ 44,692	27.5	58.9	70.8	360
2007	$ 2,103	$ 48,007	27.9	58.7	69.9	344
2008	$ 1,989	$ 46,096	26.4	59.4	69.6	358
2009	$ 2,129	$ 49,244	27.1	59.2	68.4	339
2010	$ 2,149	$ 50,074	26.2	60.4	68.5	334
2011	$ 2,179	$ 50,937	25.9	60.4	67.3	399
2012	$ 2,333	$ 53,797	26.7	60.7	66.7	367
2013	$ 2,615	$ 58,134	27.6	60.6	65.8	456
2014	$ 2,628	$ 58,976	27.7	61.2	65.5	419
2015	$ 2,572	$ 58,183	27.0	61.0	64.3	390
2016	$ 2,892	$ 64,441	27.2	61.5	63.7	396
2017	$ 2,911	$ 64,583	27.2	61.9	63.1	368
2018	$ 2,983	$ 67,985	26.6	61.5	61.7	354
2019	$ 4,628	$ 111,528	26.9	60.7	60.7	41
All FY	**$ 2,015**	**$ 46,599**	**27.4**	**59.7**	**71.8**	**8,743**

Note: 2019 is a partial year (41 retirees) and includes July 1, 2018 retirees. These retirees averages are higher since count includes primarily Administrators.

TFFR Retiree
Statistics by Formula

Fiscal Year of Retirement Ending June 30	Avg Monthly Pension	Avg Annual Salary	Avg Service Credit	Avg Retirement Age of Member	Avg Current Age of Recipient	Number of Retirees
Old formulas	$ 499	$ 8,308	25.0	59.3	88.5	73
1979-1983 or 1.00%	$ 589	$ 14,667	26.2	59.6	93.0	57
1983-1985 or 1.05%	$ 834	$ 21,048	29.7	61.3	92.7	61
1985-1987 or 1.15%	$ 932	$ 25,063	30.3	60.8	91.4	79
1987-1989 or 1.22%	$ 1,014	$ 26,589	28.5	60.1	88.9	112
1989-1991 or 1.275%	$ 1,075	$ 27,563	28.6	59.4	86.2	268
1991-1993 or 1.39%	$ 1,181	$ 31,455	28.7	58.8	83.4	217
1993-1997 or 1.55%	$ 1,220	$ 31,911	26.9	58.9	81.6	633
1997-1999 or 1.75%	$ 1,416	$ 34,244	27.4	58.8	78.7	403
1999-2001 or 1.88%	$ 1,633	$ 37,840	28.2	58.5	76.7	472
2001-present or 2.00%	$ 2,300	$ 52,397	27.2	60.0	68.0	6,368
All Formulas	**$ 2,015**	**$ 46,599**	**27.4**	**59.7**	**71.8**	**8,743**

TFFR Retiree Statistics
By Retirement Type

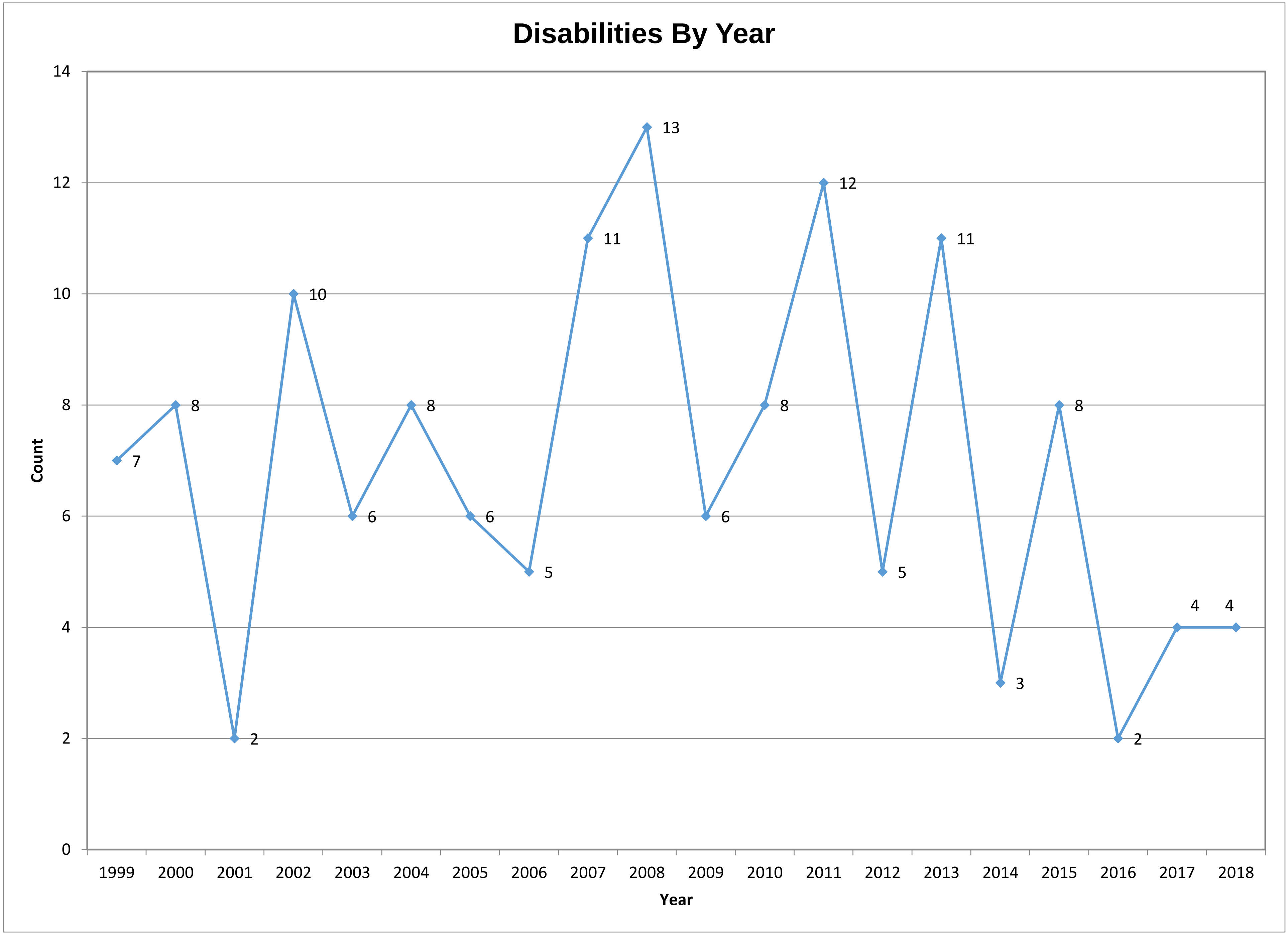
Type	Avg Monthly Pension	Avg Annual Salary	Avg Service Credit	Avg Retirement Age of Member	Avg Current Age of Recipient	Number of Retirees
Death	$ 1,276	$ 36,792	27.6	58.8	75.3	714
Disability	$ 1,241	$ 39,167	15.1	50.6	63.9	125
Early	$ 709	$ 34,862	14.8	60.3	73.1	982
Normal	$ 2,296	$ 49,418	29.4	59.9	71.5	6,896
QDRO	$ 677	$ 47,341	9.5	57.5	68.0	26
All Types	**$ 2,015**	**$ 46,599**	**27.4**	**59.7**	**71.8**	**8,743**

Disability Summary (1999 - 2018)

• Total disabilities approved since 1999 - 2018	139*
Of 139, number of physical disabilities:	120
Of 139, number of emotional disabilities:	19
• Average number of disabilities approved per year:	7
• Of 139, number that are living and drawing benefits:	92
Of 139, number that are living and returned to work:	7
Of 139, number that are deceased:	40
• Of 139, option selected was:	
Count of Single Life:	89
Count of 100% Joint & Survivor:	33
Count of 50% Joint & Survivor:	13
Count of 5 Year Certain & Life:	1
Count of 10 Year Certain & Life:	1
Count of 20 Year Certain & Life:	2
• Of 92 living and drawing benefits:	
Average service credit in years:	15.1
Average age in years:	62
Average monthly benefit:	$1,406
Average years benefit was received:	9.8
• Of 7 living and returned to work:	
Average service credit in years:	13.8
Average age in years:	59
Average monthly benefit:	$1,257
Average years benefit was received:	6

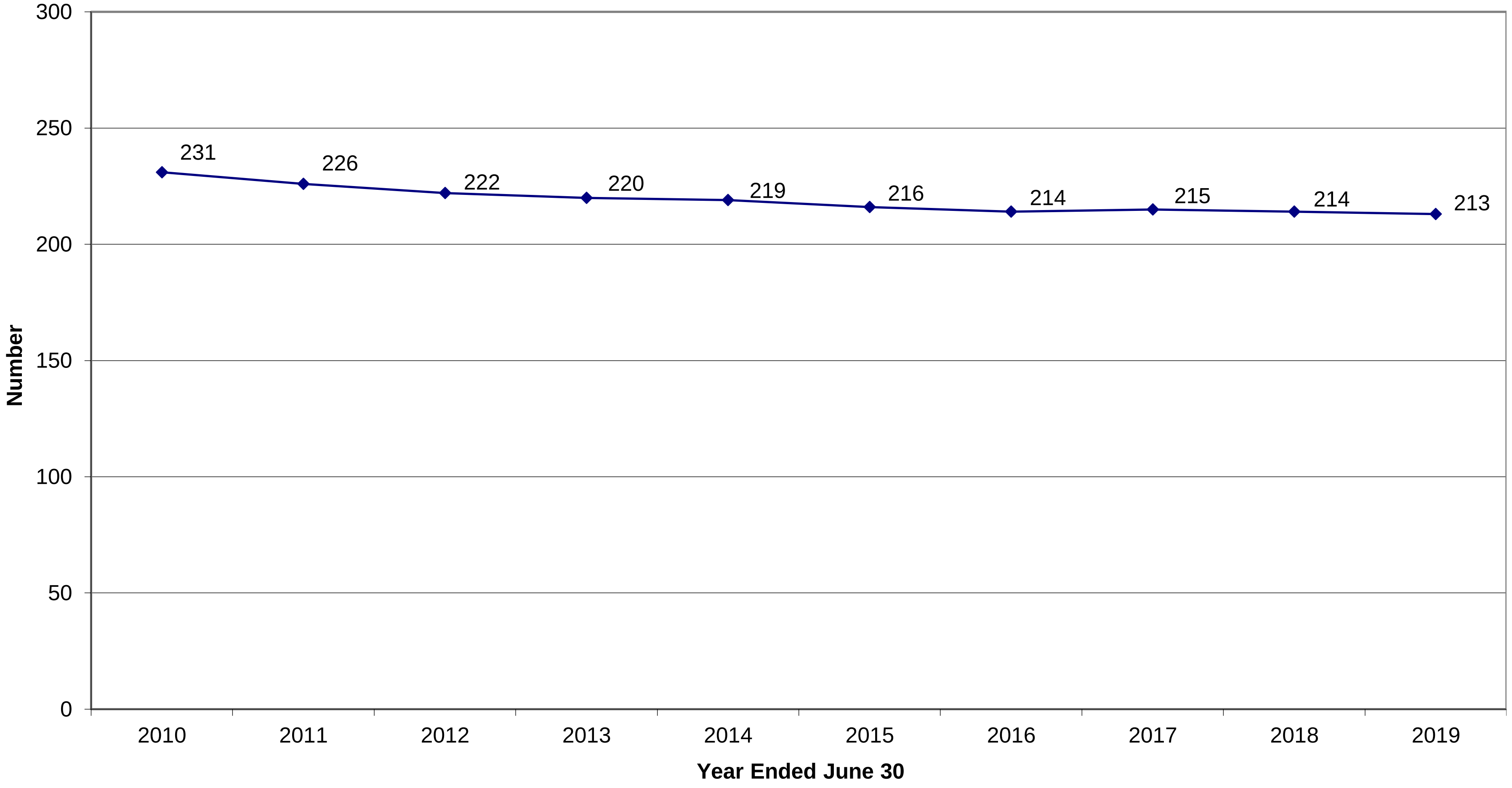
*Approved disabilities removed from total if they returned to employment then refunded or retired.

9.24.2018


Disabilities By Year
Count
0
2
4
6
8
10
12
14
Year
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
7
8
2
10
6
8
6
5
11
13
6
8
12
5
11
3
8
2
4
4

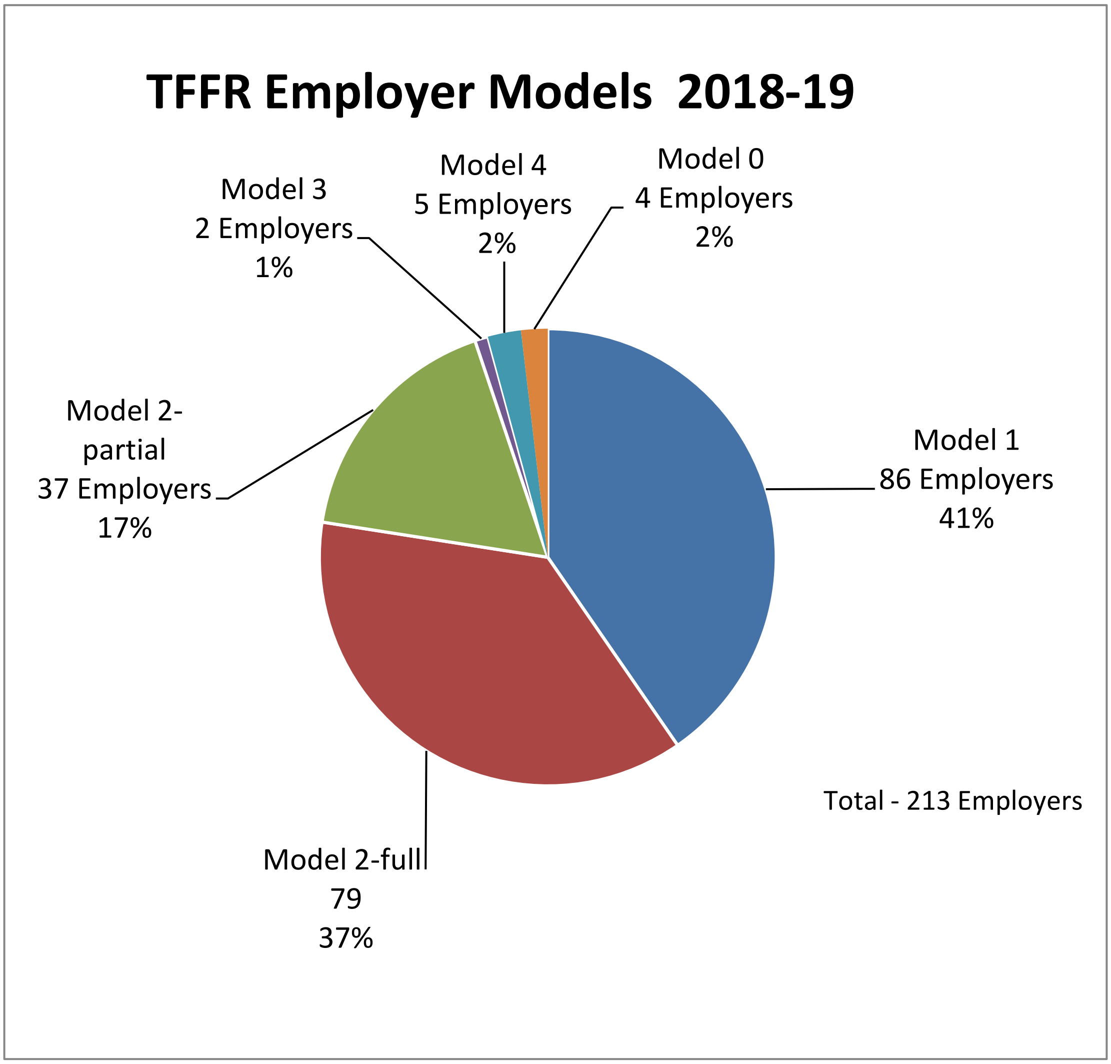
TFFR Participating Employers

2010 - Present



Model Usage 2018-2019

	Employers
Model 1	86
Model 2-full	79
Model 2-partial	37
Model 3	2
Model 4	5
Model 0	4
Total	213



North Dakota Teachers' Fund For Retirement

MEMORANDUM

TO: **TFFR Board**

FROM: **Fay Kopp**

DATE: **January 17, 2019**

SUBJ: **2018 CAFR and PPCC Award**

The 2018 NDRIO Comprehensive Annual Financial Report (CAFR) has been completed. The report contains detailed investment, financial, actuarial, and statistical information about the TFFR and SIB programs. TFFR board members were sent a link to the 2018 CAFR in December. You can view, download or print the report from the RIO website.

Please notice that the Government Finance Officers Association (GFOA) has awarded a Certificate of Achievement for Excellence in Financial Reporting to RIO for the past 20 years (see 2018 CAFR, p. 13). In order to receive the award, RIO must publish an easily readable and efficiently organized comprehensive annual financial report. The report must also satisfy both generally accepted accounting principles and applicable legal requirements. The 2018 report has been submitted to GFOA for review, and we expect it to meet the requirements for receiving the award again this year.

Also, TFFR has received the Public Pension Coordinating Council (PPCC) 2018 Public Pension Standards Award for Administration (see 2018 CAFR, p. 14). To receive the award, the retirement system must certify that it meets specific standards for a comprehensive benefit program, actuarial valuations, financial reporting, investments, and communications to members. TFFR has received an award for administration and/or funding from PPCC since 1992.

The 2018 TFFR Fast Facts has also been updated, and is available on the RIO website. This one page summary provides key actuarial, financial, and investment details about the TFFR plan.

Thanks to Connie Flanagan, Shelly Schumacher and other staff for their efforts in ensuring RIO reports and publications are updated, and that RIO receives the GFOA and PPCC awards each year.

Board Information Only. No board action is requested.

ND TFFR Fast Facts

FY End 6/30/2018

The ND Teachers' Fund for Retirement plan (ND TFFR) provides ND educators with a financial foundation for the future that includes a secure and stable retirement. This is possible due to TFFR's plan design, professional plan management, strong investment performance, and outstanding customer service.

MEMBERS

WE SERVE

10,881 **ACTIVE MEMBERS**
8,743 **RETIRED MEMBERS**
214 **EMPLOYERS**

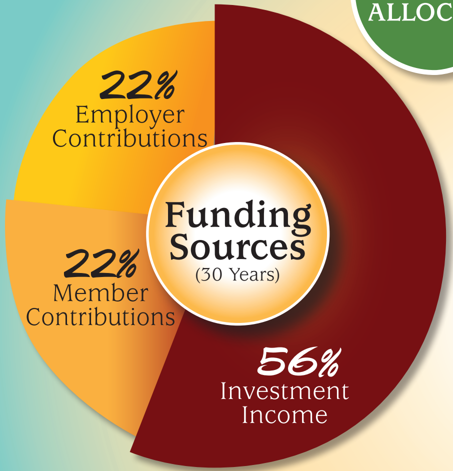
Member Stats	Actives	Retirees
Avg. Annual Salary/Benefit	$60,055	$24,180
Avg. Service Credit	11.8 yrs	27.4 yrs
Avg. Current Age	41.9 yrs	71.8 yrs

MEMBER/EMPLOYER SATISFACTION: 3.8 (4.0 Scale)

84% of benefits are paid to ND residents.

To positively impact the state's economy, **$202 million** was distributed to retirees in FY 2018.

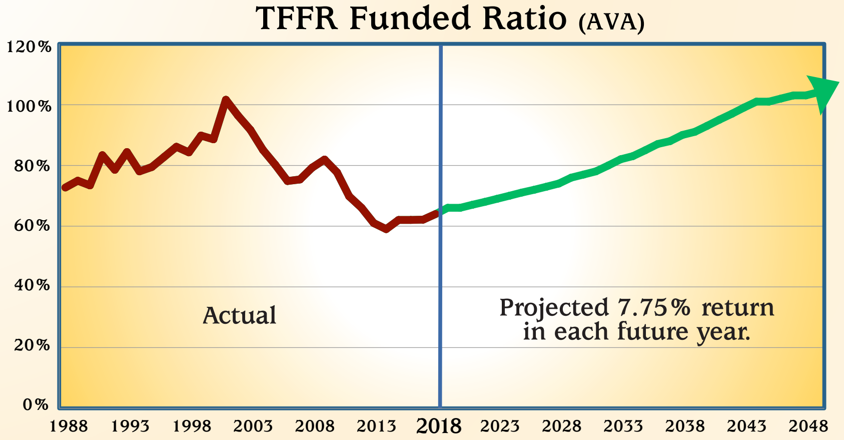
Market value of TFFR assets **$2.5 billion**



Investment Returns

1 year	9.1%
5 year	8.3%
30 year	8.0%

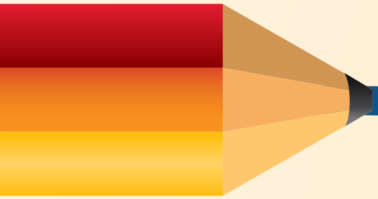
65% of BENEFITS are PREFUNDED


TFFR Funded Ratio (AVA)

TFFR's long-term funding outlook is positive, and benefits are secure for past, present, and future ND educators.

ND Teachers' Fund for Retirement, 3442 E. Century Avenue, P.O. Box 7100, Bismarck, ND 58507
1-800-952-2970 or 701-328-9885 | Email: rio@nd.gov | Website: www.nd.gov/rio/tffr

ND TFFR PLAN SUMMARY



	Tier 1 Grandfathered Member	Tier 1 Non-Grandfathered Member	Tier 2 Member
Employee Contribution Rates (active and re-employed retirees)			
7/1/10 – 6/30/12	7.75%	7.75%	7.75%
7/1/12 – 6/30/14	9.75%	9.75%	9.75%
*7/1/14 ongoing	11.75%	11.75%	11.75%
Employer Contribution Rates			
7/1/10 – 6/30/12	8.75%	8.75%	8.75%
7/1/12 – 6/30/14	10.75%	10.75%	10.75%
*7/1/14 ongoing	12.75%	12.75%	12.75%
Vesting Period	3 yrs	3 yrs	5 yrs
Unreduced Retirement Eligibility			
Minimum Age	No	60	60
AND Rule	Rule 85	Rule 90	Rule 90
OR Normal Retirement Age	65	65	65
Reduced Retirement Eligibility			
Minimum Age	55	55	55
Reduction Factor	6%	8%	8%
Retirement Formula Multiplier	2%	2%	2%
X Final Average Salary	3 yr FAS	3 yr FAS	5 yr FAS
X Service Credit	Total years	Total years	Total years
Disability Retirement	Yes	Yes	Yes
Retirement Formula Multiplier (2%) X Final Average Salary (FAS) X Total Service Credit			
Death/Survivor Benefits	Yes	Yes	Yes
Refund of account value or Life Annuity to survivor based on member's vesting status.			

Tier 1 is a member who had service credit in the TFFR plan prior to 7/1/08.

- Tier 1 Grandfathered member was less than 10 years away from retirement eligibility as of 6/30/13. Grandfathered member was vested, and either age 55 or had a combined total of service credit and age equal to or greater than 65 on 6/30/13.
- Tier 1 Non-Grandfathered member was more than 10 years away from retirement eligibility as of 6/30/13. Non-grandfathered member was less than age 55 and had a combined total of service credit and age which was less than 65 on 6/30/13.

Tier 2 is a member who began participation in the TFFR plan on 7/1/08 or after.

**Contribution rates are in effect until TFFR reaches 100% funded level, then rates reduce to 7.75% each.*

Confidential member information sent to Board through a secure link.

North Dakota
Teachers' Fund For Retirement

NDTFFR BOARD READING
JANUARY 2019

- Stability in Overall Pension Plan Funding Masks a Growing Divide, Center for Retirement Research at Boston College (CRR), October 2018.

- Balancing Objectives in Public Employee Post-Retirement Employment Policies: Reassessing Barriers to Continued Work, Center for State and Local Government Excellence (SLGE), November 2018.

- Retiree Cost of Living Adjustments, National Association of State Retirement Administrators (NASRA), December 2018.

- Pensionomics 2018: Measuring the Economic Impact of DB Pension Expenditures, National Institute on Retirement Security (NIRS), December 2018.

- Teacher Pensions vs. 401(k)s in Six States: Connecticut, Colorado, Georgia, Kentucky, Missouri, and Texas, National Institute on Retirement Security (NIRS), January 2019.