St. Paul Teachers' Retirement Fund Association

Actuarial Valuation as of July 1, 2017

GRS Retirement Consulting

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December 21, 2017

Ms. Jill E. Schurtz, Executive Director
St. Paul Teachers' Retirement Fund Association
1619 Dayton Avenue, Room 309
St. Paul, MN 55104-6206

Dear Ms. Schurtz:

We are pleased to present the report of the actuarial valuation of the St. Paul Teachers' Retirement Fund Association ("Fund") as of July 1, 2017. This report provides, among other things, the required annual contribution rate of the Fund for the Plan Year commencing July 1, 2017 and ending on June 30, 2018, according to prescribed assumptions.

The valuation was based upon information furnished by the Fund staff, concerning Retirement Fund benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. Their efforts in furnishing the materials needed are gratefully acknowledged. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by the Fund.

The report has been prepared at the request of the Fund's Board of Trustees in accordance with Section 356.215 of the Minnesota Statutes as well as the Standards for Actuarial Work established by the State of Minnesota Legislative Commission on Pensions and Retirement. To the best of our knowledge, this report is complete and accurate, and has been prepared in accordance with prescribed assumptions and generally accepted actuarial principles and practices. This report is intended for use by the Fund and those determined or approved by the Fund's Board of Trustees. This report may be provided to parties other than the Fund only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

The required contribution rate of 22.16% of pay shown on page 20 was designed to comply with Minnesota Statutes. Users of this report should be aware that contributions made at that rate do not guarantee benefit security. Please note that, given the importance of benefit security to any retirement system, we encourage all retirement systems to consider implementing funding programs that provide for contributions in excess of the levels listed in their valuation report.

The contribution rate in this report is determined using the actuarial assumptions and methods disclosed in Section 4 of this report. This report includes risk metrics on page 8, but does not include a robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment. We encourage a review and assessment of investment and other significant risks that may have a material effect on the plan's financial condition.

This valuation assumed the continuing ability of the plan sponsor to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

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 or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of such future measurements.

This report should not be relied on for any purpose other than the purpose described in this report. Determinations of financial results associated with the benefits described in this report in a manner other than the intended purpose may produce significantly different results.

Actuarial assumptions, including discount rates, mortality tables and others identified in this report, are prescribed by Minnesota Statutes Section 356.215, the Legislative Commission on Pensions and Retirement (LCPR), and the Board of Trustees. These parties are responsible for selecting the plan's funding policy, actuarial valuation methods, asset valuation methods, and assumptions. The policies, methods and assumptions used in this valuation are those that have been so prescribed and are described in the Actuarial Basis of this report. The Fund is solely responsible for communicating to GRS any changes required thereto.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. Bonita J. Wurst and James D. Anderson are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor.

We will be pleased to review this report with you at your convenience.

Respectfully submitted,

Bonita J. Wurst   James D. Anderson

Bonita J. Wurst, ASA, EA, FCA, MAAA   James D. Anderson, FSA, EA, MAAA

BJW/JDA:rmn:dj

Other Observations

General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if there are no changes in benefits or contributions and all actuarial assumptions are met (including the assumption of the plan earning 8.0% on the actuarial value of assets), it is expected that:

(1) The unfunded actuarial accrued liabilities will increase in the short-term but will be fully amortized after approximately 40 years, and
(2) The funded status of the plan will continue to increase towards a 100% funded ratio.

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

(1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations; in other words, of transferring the obligations to an unrelated third party in an arm's length market value type transaction.

(2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).

(3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets.

Discount Rate Assumption

In a 2017 analysis of long-term rate of investment return and inflation assumptions, GRS suggested that an investment return assumption in the range of 7.12% to 7.95% would be reasonable. The current assumed rate, which is mandated by Minnesota Statutes, is 8.00% and is at the upper end of the reasonable range. This report also concluded that the probability of exceeding the current 8.00% assumption over 20 years is only 38%. Please see the draft report, St. Paul Teachers' Retirement Fund Association 5-Year Experience Study, dated November 14, 2017 for additional information.

Professional standards require GRS to evaluate this assumption each year. If an assumption is deemed unreasonable based on current information, we would have to qualify the work that we do for the Fund.

GRS believes the 8.00% return rate is within the reasonable range for this valuation as of July 1, 2017, but cautions the Fund that declining capital market and inflation expectations may result in 8.00% being deemed unreasonable for future valuations. In such an instance we would still comply with statutes and produce the valuation based upon 8.00%, but Actuarial Standards would require us to issue a "qualified" report.

GRS previously recommended reducing the investment return assumption to 7.50%, and the Fund has proposed legislation to enact this recommended assumption change. Although the proposed legislation passed the Minnesota House and Senate during 2017, the legislation was vetoed by the Governor. Reducing the investment return assumption remains a priority for the Fund.

If a lower investment return rate were used in this valuation instead of 8.00%, the unfunded liability and the contribution deficiency would be higher than shown in this report. Note that estimated results based on a 7.0% discount rate are shown on page 6.

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Summary of Valuation Results

This report sets forth the results of the actuarial valuation of the St. Paul Teachers' Retirement Fund Association ("Fund") as of July 1, 2017. The purposes of this valuation are:

1. To develop the Actuarially Determined Contribution (ADC) rates.
2. To compare the ADC rates with the current funding policy in place.
3. To review the funding status of the Fund.

The funding status, in basic terms, is a comparison of the Fund's liabilities to assets expressed as either an unfunded liability (i.e., the difference between the assets and liabilities) or as a ratio of assets to liabilities. This comparison can be measured in various ways. Fund liabilities are dependent on the actuarial assumptions and actuarial cost method. Fund assets can be measured at market value, book value, or some variation to smooth the fluctuations that invariably occur from year to year. The Actuarial Value of Assets is determined from market value with investment gains and losses smoothed over a five-year period.

Contribution Rates

The required contribution rate (as defined in Section 356 of Minnesota Statutes) decreased slightly, from 22.44% of pay for the fiscal year ending June 30, 2017, to 22.16% of pay for the fiscal year ending June 30, 2018. The statutory contribution rate increased from 21.52% of payroll to 21.64% of payroll. The contribution shortfall decreased from 0.92% of pay as of July 1, 2016 to 0.52% of pay. In dollar terms, the deficiency was reduced from $2.5 million to $1.5 million per year. On a market value of assets basis, statutory contributions are deficient by 0.66% of pay.

Current statutory contributions are not sufficient to fully amortize the unfunded actuarial accrued liability over the remaining statutory amortization period of 25 years. Based on current statutory contributions, the actuarial value of assets, and other methods and assumptions described in this report, the unfunded liability is expected to increase in the short-term but be fully amortized after approximately 40 years.

Assets and Liabilities

On an actuarial value of assets basis, the funding ratio increased from 63.25% at July 1, 2016, to 64.45% at July 1, 2017.

Total actuarial liabilities increased from $1,592.6 million to $1,611.2 million. One of the key assumptions in the valuation is the date COLAs are expected to be paid. In the prior valuation, a 2% COLA was expected to be paid in approximately 39 years and a 2.5% COLA was expected to be paid in 50 years. For the 2017 valuation, a 2% COLA is expected to be paid in 25 years and the 2.5% COLA is expected to be paid in 35 years. This earlier recognition of assumed COLA increases was the primary reason for the increase in actuarial liabilities.

As shown in the table on the following page, on a market value of assets basis, the funding ratio increased from 60.26% at July 1, 2016, to 64.07% at July 1, 2017. This increase was primarily due to exceeding the 8% investment return target for the prior fiscal year.

Summary of Valuation Results

Market Value of Assets Basis

A 5-year smoothed value of assets, used to determine both the funded status and required contribution level, reduces the volatility of the valuation results. As of July 1, 2017, the actuarial value of assets was 100.6% of market value.

The following table shows the July 1, 2017 valuation results, on both a market value and smoothed actuarial value basis:

Results as of July 1, 2017		
	Market Value of Assets	Actuarial Value of Assets
Actuarial Accrued Liability	$1,611.2 million	$1,611.2 million
Value of Assets	$1,032.2 million	$1,038.5 million
Unfunded Actuarial Accrued Liability	$ 579.0 million	$ 572.7 million
Funded Ratio	64.07%	64.45%
Statutory Contribution Rate	21.64% of pay	21.64% of pay
Required Contribution Rate	22.30% of pay	22.16% of pay
Deficiency	0.66% of pay	0.52% of pay

Changes Reflected in the Valuation

Assumption Changes

Combined Service Annuity Assumption

Updated loading factors to account for members with Combined Service Annuities (CSA) were approved by the Legislative Commission on Pensions and Retirement (LCPR) based on an analysis completed by the LCPR actuary and documented in a report dated October 2016. The prior CSA assumptions were based on a 2001 study performed by a prior actuary. The factors were updated as follows:

- Active members: Reduced from 2% for member liability if hired after June 30, 1989 (7% for members hired prior to July 1, 1989) to 0%.
- Deferred Vested members: Reduced from 30% to 20%.
- Non-vested Terminated members: Reduced from 30% to 9%.

Summary of Valuation Results

COLA Assumption

Minnesota Statutes were revised in 2014 to establish a process for setting a COLA assumption for purposes of preparing actuarial valuations. Pursuant to this legislation, if the plan has not yet reached the statutory funding ratio threshold triggering payment of a 2.0% or 2.5% COLA, the actuary must perform a projection to determine whether the plan is expected to attain the funding ratio threshold in a timeframe that is actuarially meaningful, and if so, the expected change to a 2.0% or 2.5% COLA rate must be reflected in the liability calculations.

We performed a projection of liabilities and assets, using the 2017 valuation results as a baseline and assuming future experience follows the valuation assumptions prescribed in Minnesota Statutes. In addition, the projection utilized the following methods and assumptions:

- Future investment returns of 8.00%
- Open group; stable active population (new member profile based on average new members hired in recent years)
- The COLA is assumed to be 1.0% per year until the funding ratio threshold required to pay a 2.0% COLA is reached and is assumed to be 2.0% per year until the threshold required to pay a 2.5% COLA is reached
- Current statutory contribution levels including scheduled increases

Based on these assumptions and methods, the projection indicates that this plan is expected to attain the funding ratio threshold to pay the 2.0% COLA in approximately 25 years, and the funding ratio threshold to pay the 2.5% COLA in approximately 35 years. The liabilities in this report are based on the assumption that the COLA will equal 1.0% through 2041, 2.0% for 2042 through 2051, and 2.5% for all years thereafter. This is only an assumption; not a guarantee of benefits to be paid. Actual timing will depend upon actual experience.

Plan Changes

There have been no plan changes since the previous valuation as of July 1, 2016.

Summary of Valuation Results

Effects of Changes (Actuarial Value of Assets Basis)

The combined impact of the changes described above was to decrease the accrued liability by $8.2 million and decrease the required contribution by 0.12% of pay, as follows:

	Results as of July 1, 2017 ($000s)	
	Prior to Changes	Reflecting Assumption Changes
A. FUNDING RATIOS		
1. Accrued Liability Funding Ratio		
a. Current Assets	$ 1,038,467	$ 1,038,467
b. Actuarial Accrued Liability	1,619,387	1,611,208
c. Funding Ratio	64.13%	64.45%
2. Projected Benefit Funding Ratio		
a. Current and Expected Future Assets	$ 1,771,640	$ 1,773,650
b. Current and Expected Future Benefit Obligations	1,850,927	1,847,501
c. Funding Ratio	95.72%	96.00%
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost	8.87%	8.93%
2. Supplemental Contribution Amortization	13.08%	12.90%
3. Allowance for Administrative Expenses	0.33%	0.33%
4. Total	22.28%	22.16%

Participants

Active membership increased 0.5% during fiscal year 2017 from 3,534 to 3,550 (figures include members on leave of absence). The level of member contributions received during the year also increased.

Total participants receiving benefits under the Fund, including disabled retirees, beneficiaries, and alternate payees, increased 3.4% during fiscal year 2017 from 3,723 to 3,851. Total expenditures for these benefits increased from $111.2 million to $112.8 million during fiscal year 2017, or 1.4%.

Asset Valuation Method

The method used to develop the Fund's Actuarial Value of Assets, as set out in the LCPR Standards for Actuarial Work, is as follows: In years when Fund assets earn above the assumed rate (i.e., experience gain) or below the assumed rate (i.e., experience loss) the gain (or loss) will be recognized over five years. This approach both removes volatility of the Fund's level of required contributions and ensures the Fund's assets will track the market value of assets.

Summary of Valuation Results

(Dollars in Thousands)

Experience Analysis

The experience analysis provides a comparison of actual experience to projected experience based on the actuarial assumptions over the past year. Overall, the Fund had an experience gain of $16.2 million. In general, salary increases were slightly smaller than predicted under the current valuation assumption and produced an actuarial gain of $145,000. Additionally, demographic experience resulted in an experience gain of $8.2 million.

The Fund also experienced an experience gain due to investments. The market value of Fund assets returned 13.93% (net of fees) for the year ended June 30, 2017, greater than the 8.00% assumption. However, only 20% of this asset gain was recognized in the actuarial value of assets. Investment gains from previous years were recognized this year and resulted in a gain of $8.0 million on the actuarial value of assets. The rate of return on the actuarial value of assets for 2017 is 8.8%.

The changes in unfunded actuarial accrued liabilities are shown in Table 10 in Section 3.

Summary of Valuation Results

(Dollars in Thousands)

Sensitivity Tests

During the 2017 legislative session, the Legislative Commission on Pensions and Retirement (LCPR) enacted a new sensitivity disclosure requirement for the Fund's 2017 valuations. Per the LCPR's requirement, we have calculated the liabilities associated with the following scenarios:

1) 7% interest rate assumption
2) 9% interest rate assumption
3) 1.0% post-retirement benefit increase for all future years (no COLA trigger)
4) 2.5% post-retirement benefit increase for all future years (no COLA trigger)

In each case, all other assumptions were unchanged from those used to develop the final valuation results in this report. Note that we believe the 9% interest rate assumption is an unrealistic long term assumption.

	Final Valuation Assumptions	Final Valuation Assumptions with			
		7% interest	**9% interest**	**1% COLA**	**2.5% COLA**
Normal Cost Rate, % of Pay	9.0%	11.2%	7.3%	8.6%	9.6%
Amortization of Unfunded Accrued Liability, % of Pay	12.9%	15.5%	10.4%	12.5%	17.3%
Expenses (% of Pay)	0.3%	0.3%	0.3%	0.3%	0.3%
Total Required Contribution, % of Pay	22.2%	27.0%	18.0%	21.5%	27.2%
Contribution Sufficiency/(Deficiency), % of Pay	(0.5)%	(5.2)%	3.6 %	0.3 %	(5.6)%
Accrued Liability Funding Ratio (AVA basis)	64.5%	57.9%	71.2%	65.2%	57.5%
Actuarial Accrued Liability (in millions)	$1,611.2	$1,794.7	$1,457.5	$1,593.4	$1,807.6
Unfunded Accrued Liability (in millions)	$ 572.7	$ 756.2	$ 419.0	$ 554.9	$ 769.1

Summary of Valuation Results

(Dollars in Thousands)

		July 1, 2016 Valuation	July 1, 2017 Valuation
A.	CONTRIBUTIONS % OF PAYROLL (Table 11)		
	1. Statutory Contributions - Chapter 354A	21.52%	21.64%
	2. Required Contributions - Chapter 356	22.44%	22.16%
	3. Sufficiency / (Deficiency)	(0.92%)	(0.52%)
B.	FUNDING RATIOS		
	1. Accrued Liability Funding Ratio		
	a Current Assets (Table 1)	$ 1,007,360	$ 1,038,467
	b. Actuarial Accrued Liability (Table 9)	1,592,570	1,611,208
	c. Funding Ratio	63.25%	64.45%
	2. Projected Benefit Funding Ratio (Table 8)		
	a. Current and Expected Future Assets	$ 1,741,583	$ 1,773,650
	b. Current and Expected Future Benefit Obligations	1,815,411	1,847,501
	c. Funding Ratio	95.93%	96.00%
C.	PLAN PARTICIPANTS		
	1. Active Members		
	a. Number (Table 3)	3,455	3,409
	b. Projected Annual Earnings	$ 271,781	$ 280,785
	c. Average Annual Earnings (Projected dollars)	$ 76,094	$ 78,060
	d. Average Age	44.8	44.8
	e. Average Service	12.7	12.7
	f. Members on Leave of Absence	79	141
	2. Others		
	a. Service Retirements (Table 4)	3,363	3,478
	b. Disability Retirements (Table 5)	32	30
	c. Survivors (Table 6)	328	343
	d. Deferred Retirements (Table 7)	2,020	2,034
	e. Terminated Other Non-Vested (Table 7)	2,915	2,945
	f. Total - Others	8,658	8,830
	3. Grand Total (1.a + 1.f + 2.f)	12,192	12,380

Summary of Valuation Results

(Dollars in Thousands)

Risk Measures Summary

Valuation Date (July 1)	(1) Accrued Liabilities (AAL)	(2) Market Value of Assets	(3) Market Value Unfunded AAL (1) - (2)	(4) Valuation Payroll	(5) Market Value Funded Ratio (2) / (1)	(6) Retiree Liabilities	(7) RetLiab/ AAL (6) / (1)	(8) AAL/ Payroll (1) / (4)	(9) Assets/ Payroll (2) / (4)
2010	$1,471,630	$815,307	$656,323	$239,996	55.4%	$950,858	64.6%	613.2%	339.7%
2011	1,389,875	950,121	439,754	239,738	68.4%	939,005	67.6%	579.7%	396.3%
2012	1,471,216	881,926	589,290	239,053	59.9%	979,866	66.6%	615.4%	368.9%
2013	1,467,350	933,082	534,268	247,432	63.6%	988,123	67.3%	593.0%	377.1%
2014	1,533,603	1,045,435	488,168	259,740	68.2%	1,015,617	66.2%	590.4%	402.5%
2015	1,596,770	1,014,969	581,801	263,844	63.6%	1,053,824	66.0%	605.2%	384.7%
2016	1,592,570	959,666	632,904	258,787	60.3%	1,052,827	66.1%	615.4%	370.8%
2017	1,611,208	1,032,249	578,959	264,342	64.1%	1,068,690	66.3%	609.5%	390.5%

Valuation Date (July 1)	(10) Portfolio StdDev	(11) Std Dev % of Pay (9) x (10)	(12) Unfunded / Payroll (3) / (4)	(13) Non-Investment Cash Flow (NICF)	(14) NICF/ Assets (13) / (2)	(15) Market Rate of Return	(16) 5-Year Average
2010				$(58,006)		13.1%	
2011			183.4%	(60,117)	(6.3%)	25.0%	
2012			246.5%	(64,220)	(7.3%)	(0.2%)	
2013			215.9%	(63,553)	(6.8%)	13.5%	
2014			187.9%	(55,823)	(5.3%)	18.4%	13.7%
2015			220.5%	(56,223)	(5.5%)	2.7%	11.5%
2016	13.4%	49.7%	244.6%	(56,778)	(5.9%)	0.3%	6.7%
2017	13.4%	52.3%	219.0%	(56,136)	(5.4%)	13.9%	9.5%

Notes pertaining to numbered columns:

(5) The Funded ratio is the most widely known measure of a plan's financial strength, but the trend in the funded ratio is much more important than the absolute ratio. The funded ratio should trend to 100%. As it approaches 100%, it is important to re-evaluate the level of investment risk in the portfolio and potentially to re-evaluate the assumed rate of return.

(6) and (7) The ratio of Retiree liabilities to total accrued liabilities gives an indication of the maturity of the system. As the ratio increases, cash flow needs increase, and the liquidity needs of the portfolio change. A ratio on the order of 50% indicates a maturing system.

(8) and (9) The ratios of liabilities and assets to payroll gives an indication of both maturity and volatility. Many systems have ratios between 500% and 700%. Ratios significantly above that range may indicate difficulty in supporting the benefit level as a level % of payroll.

(10) and (11) The portfolio standard deviation measures the volatility of investment return. When multiplied by the ratio of assets to payroll it gives the effect of a one standard deviation asset move as a percent of payroll. This figure helps users understand the difficulty of dealing with investment volatility and the challenges volatility brings to sustainability.

(12) The ratio of unfunded liability to payroll gives an indication of the plan sponsor's ability to actually pay off the unfunded liability. A ratio above approximately 300% or 400% may indicate difficulty in discharging the unfunded liability within a reasonable time frame.

(13) and (14) The ratio of non-investment cash flow to assets is an important measure of sustainability. Negative ratios are common and expected for a maturing system. In the longer term, this ratio should be on the order of approximately -4%. A ratio that is significantly more negative than that for an extended period could be a leading indicator of potential exhaustion of assets.

(15) and (16) Investment return is probably the largest single risk that most systems face. The year by year return and the 5-year geometric average give an indicator of the realism of the systems assumed return. Of course, past performance is not a guarantee of future results.

SECTION 1

ASSET INFORMATION

Assets of the Plan

The cost value of the plan assets decreased from $838.7 million as of June 30, 2016 to $818.7 million as of June 30, 2017. The market value of the plan assets increased from $959.7 million as of June 30, 2016 to $1,032.2 million as of June 30, 2017. The expected return on assets using the valuation investment return rate assumption of 8.0 percent was $75 million. The actual plan experience showed a return on assets of $128.7 million. Twenty percent of the asset return above the expected $75 million is recognized as an actuarial gain in the development of the actuarial value of assets. The recognized gain from the current year, along with the portion of prior gains and losses recognized this year, results in an overall gain of $8.0 million on the actuarial value of assets.

The 2014 and 2017 asset gains as well as the 2015 and 2016 asset losses (investment returns that fell above (gain) or below (loss) the expected return - amounts shown on the next page) will be recognized incrementally over the next four years. As of July 1, 2017, there are slightly more unrecognized asset losses than gains, and the Actuarial Value of Assets (AVA) is only slightly higher than the Market Value of Assets (MVA).

Table 1 shows the composition of assets as of June 30, 2017 and the development of the actuarial value of assets as of June 30, 2017. Table 2 details the development of asset values during fiscal year 2017.

Table 1
Accounting Balance Sheet
as of June 30, 2017
(dollars in thousands)

		Market Value	Cost Value
A. ASSETS			
1. Cash, Equivalents, Short-Term Securities		$ 32,899	$ 32,899
2. Investments			
a. Fixed Income		188,598	179,316
b. Equity		637,561	460,644
c. Real Estate		69,727	49,807
d. Alternative		102,628	95,209
3. Other Assets		3,289	3,289
B. TOTAL ASSETS		$ 1,034,702	$ 821,164
C. AMOUNTS CURRENTLY PAYABLE		$ 2,453	$ 2,453
D. ASSETS AVAILABLE FOR BENEFITS			
1. Member Reserves		$ 187,955	$ 187,966
2. Employer Reserves		844,294	630,745
3. Total Assets Available for Benefits		$ 1,032,249	$ 818,711
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS		$ 1,034,702	$ 821,164
F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS			
1. Market Value of Assets Available for Benefits (D.3)		$ 1,032,249	
2. Unrecognized Asset Returns			
a. June 30, 2017	$ 54,191		
b. June 30, 2016	(77,451)		
c. June 30, 2015	(55,629)		
d. June 30, 2014	95,762		
3. UAR Adjustment: .80 * 2(a) + .60 * 2(b) + .40 * 2(c) + .20 * 2(d)		(6,218)	
4. Actuarial Value of Assets: (F.1 - F.3)		$ 1,038,467	

DERIVATION OF OTHER ASSETS *	Market Value
Accounts Receivable	
Employer Contribution	$ 368
Employee Contribution	256
Service Purchases Receivable	31
Pensions Receivable	10
State Contributions	838
Real Estate Income Receivable	81
Commission Recapture Receivable	1
Interest Receivable	617
Dividend Receivable	93
Misc. Receivable	-
Escrow Funds receivable	-
Sale of Securities	941
Total Accounts Receivable	$ 3,236
Fixed Assets	53
Total Other Assets	$ 3,289

**Numbers may not add due to rounding.*

Table 2
Change(s) in Assets Available for Benefits
as of June 30, 2017
(dollars in thousands)

		Market Value	Cost Value
A.	ASSETS AVAILABLE AT BEGINNING OF PERIOD	$ 959,666	$ 838,738
B.	OPERATING REVENUES		
1.	Member Contributions	$ 20,146	$ 20,146
2.	Employer Contributions	27,543	27,543
3.	Supplemental Contributions	10,665	10,665
4.	Reempoyed Annuitant Employer Contributions	142	142
5.	Investment Income	12,999	12,999
6.	Investment Expenses	(4,823)	(4,823)
7.	Net Realized Gain / (Loss)	27,933	27,933
8.	Other	0	0
9.	Net Change in Unrealized Gain / (Loss)	92,610	0
10.	Total Operating Revenue	$ 187,215	$ 94,605
C.	OPERATING EXPENSES		
1.	Service Retirements	$ 100,965	$ 100,965
2.	Disability Benefits	605	605
3.	Survivor Benefits	11,201	11,201
4.	Refunds	972	972
5.	Administrative Expenses	889	889
6.	Total Operating Expenses	$ 114,632	$ 114,632
D.	OTHER CHANGES IN RESERVES	$ 0	$ 0
E.	ASSETS AVAILABLE AT END OF PERIOD	$ 1,032,249	$ 818,711
F.	DETERMINATION OF CURRENT YEAR UNRECOGNIZED ASSET RETURN		
1.	Average Balance		
	(a) Assets available at BOY		$ 959,666
	(b) Assets available at EOY		1,032,249
	(c) Average balance {[(a) + (b) - Net Investment Income] / 2}		$ 931,598
	{Net investment income: B.5+B.6+B.7+B.9}		
2.	Expected Return: .080 * F.1		74,528
3.	Actual Return		128,719
4.	Current Year Gross Asset Gain/(Loss): F.3 - F.2		$ 54,191

SECTION 2

TOTAL MEMBERSHIP DATA

Table 3
Active Members as of June 30, 2017*

Age	Years of Service: <5	5-9	10-14	15-19	20-24	25-29	30-34	35+	ALL
< 25	25	0	0	0	0	0	0	0	25
25-29	222	32	0	0	0	0	0	0	254
30-34	224	179	18	0	0	0	0	0	421
35-39	172	135	161	30	0	0	0	0	498
40-44	143	73	116	196	23	0	0	0	551
45-49	86	54	77	167	182	9	0	0	575
50-54	63	36	48	95	131	78	18	1	470
55-59	48	22	33	85	84	93	71	4	440
60-64	19	7	26	43	61	45	26	20	247
65+	18	8	7	11	7	7	6	5	69
ALL	1,020	546	486	627	488	232	121	30	3,550

AVERAGE ANNUAL EARNINGS

Age	Years of Service: <5	5-9	10-14	15-19	20-24	25-29	30-34	35+	ALL
< 25	38,643	0	0	0	0	0	0	0	38,643
25-29	47,432	59,694	0	0	0	0	0	0	48,977
30-34	52,705	65,399	74,175	0	0	0	0	0	59,020
35-39	56,047	73,033	79,672	81,543	0	0	0	0	69,825
40-44	56,017	73,541	79,264	84,135	92,605	0	0	0	74,762
45-49	59,784	75,378	81,219	86,468	92,254	92,297	0	0	82,655
50-54	48,462	74,341	77,759	87,865	88,789	96,571	100,457	129,371	82,788
55-59	37,842	74,828	79,544	85,492	88,773	94,457	98,139	81,407	83,839
60-64	34,687	76,065	73,828	79,803	87,721	91,769	90,852	105,172	82,950
65+	16,527	29,648	49,712	75,328	83,588	98,576	86,872	117,978	59,384
ALL	50,902	69,610	78,674	84,930	90,050	94,687	96,359	104,944	73,840

	Prior Fiscal Year Earnings (IN THOUSANDS) by Years of Service: <5	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	ALL
ALL	51,920	38,007	38,236	53,251	43,944	21,967	11,659	3,148	262,133

Including those on leave of absence; pay annualized for new hires.

Table 4
Service Retirements as of June 30, 2017

Age	Years Retired <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	0	0	0	1	0	0	0	0	0	1
45-49	0	0	0	1	0	0	0	0	0	1
50-54	3	0	0	0	0	0	0	0	0	3
55-59	91	2	0	0	0	0	0	0	0	93
60-64	309	122	0	0	0	0	0	0	0	431
65-69	361	366	222	1	0	0	0	0	0	950
70-74	78	257	338	190	4	0	0	0	0	867
75-79	10	29	128	221	117	1	0	0	0	506
80-84	4	7	16	102	172	42	0	0	0	343
85-89	0	0	3	5	79	55	43	0	0	185
90+	0	0	1	2	7	26	47	15	0	98
ALL	856	783	708	523	379	124	90	15	0	3,478

AVERAGE ANNUAL BENEFIT

Age	Years Retired <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	0	0	0	5,768	0	0	0	0	0	5,768
45-49	0	0	0	5,768	0	0	0	0	0	5,768
50-54	13,071	0	0	0	0	0	0	0	0	13,071
55-59	18,629	3,662	0	0	0	0	0	0	0	18,307
60-64	25,182	25,442	0	0	0	0	0	0	0	25,257
65-69	19,577	27,867	35,864	5,767	0	0	0	0	0	26,563
70-74	15,699	24,163	34,235	31,042	45,886	0	0	0	0	28,936
75-79	2,292	20,230	28,049	36,607	39,569	67,960	0	0	0	33,572
80-84	8,132	8,438	20,821	36,563	42,895	28,674	0	0	0	37,133
85-89	0	0	1,367	19,014	49,597	37,091	35,289	0	0	40,944
90+	0	0	32,392	31,934	51,462	33,746	24,182	23,488	0	28,803
ALL	20,869	25,755	33,183	34,214	43,455	33,788	29,488	23,488	0	29,639

	Total Annual Benefit (IN THOUSANDS) by Years RETIRED <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
ALL	17,864	20,166	23,494	17,894	16,470	4,190	2,654	352	0	103,084

Table 5
Disability Retirements as of June 30, 2017*

	Years Disabled									
Age	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	1	0	0	0	0	0	0	0	0	1
45-49	1	1	0	0	0	0	0	0	0	2
50-54	3	3	0	0	0	0	0	0	0	6
55-59	2	2	1	0	1	0	0	0	0	6
60-64	4	7	2	1	0	0	0	0	0	14
65-69	0	0	0	1	0	0	0	0	0	1
70-74	0	0	0	0	0	0	0	0	0	0
75-79	0	0	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	0	0	0	0	0
85-89	0	0	0	0	0	0	0	0	0	0
90+	0	0	0	0	0	0	0	0	0	0
ALL	11	13	3	2	1	0	0	0	0	30

AVERAGE ANNUAL BENEFIT

	Years Disabled									
Age	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	3,490	0	0	0	0	0	0	0	0	3,490
45-49	34,015	7,875	0	0	0	0	0	0	0	20,945
50-54	22,199	13,960	0	0	0	0	0	0	0	18,079
55-59	19,568	8,936	24,916	0	5,694	0	0	0	0	14,603
60-64	30,799	24,687	8,852	28,002	0	0	0	0	0	24,408
65-69	0	0	0	9,869	0	0	0	0	0	9,869
70-74	0	0	0	0	0	0	0	0	0	0
75-79	0	0	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	0	0	0	0	0
85-89	0	0	0	0	0	0	0	0	0	0
90+	0	0	0	0	0	0	0	0	0	0
ALL	24,221	18,495	14,206	18,936	5,694	0	0	0	0	19,769

	Total Annual Benefit (IN THOUSANDS) by Years DISABLED									
	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
ALL	266	240	43	38	6	0	0	0	0	593

** Disability benefits convert to normal retirement benefits at normal retirement age (which occurs between ages 65 and 66).*

Table 6
Survivors as of June 30, 2017

Age	Years Since Member Death									
	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	5	2	0	0	0	0	0	0	0	7
45-49	0	0	3	0	0	0	0	0	0	3
50-54	1	0	2	0	0	0	0	0	0	3
55-59	4	3	0	0	0	0	0	0	0	7
60-64	4	4	0	5	1	0	0	0	1	15
65-69	9	0	4	4	2	3	0	1	0	23
70-74	14	2	6	13	7	3	1	0	0	46
75-79	13	0	3	11	20	5	5	2	0	59
80-84	28	0	1	9	15	21	11	1	0	86
85-89	11	0	1	0	5	13	17	4	3	54
90+	3	0	0	0	1	6	21	7	2	40
ALL	92	11	20	42	51	51	55	15	6	343

AVERAGE ANNUAL BENEFIT

Age	Years Since Member Death									
	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	22,513	7,493	0	0	0	0	0	0	0	18,222
45-49	0	0	730	0	0	0	0	0	0	730
50-54	1,940	0	824	0	0	0	0	0	0	1,196
55-59	35,870	8,029	0	0	0	0	0	0	0	23,938
60-64	26,743	13,800	0	8,247	49,403	0	0	0	3,350	17,078
65-69	23,825	0	42,819	27,725	26,647	37,479	0	20,582	0	29,692
70-74	38,266	25,454	24,125	21,313	37,066	20,582	24,598	0	0	29,440
75-79	39,707	0	16,965	32,693	40,682	30,759	28,554	21,887	0	35,266
80-84	48,373	0	65,158	30,540	47,439	36,554	26,356	17,625	0	40,479
85-89	37,430	0	40,687	0	46,305	40,215	35,810	24,042	32,385	37,200
90+	23,194	0	0	0	54,745	43,978	32,400	26,073	26,480	32,602
ALL	37,685	13,198	23,830	25,326	42,620	36,907	31,754	24,044	25,577	33,437

	Total Annual Benefit (IN THOUSANDS) by Years Since Member Death									
	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
ALL	3,467	145	477	1,064	2,174	1,882	1,746	361	153	11,469

Table 7
Reconciliation of Members
as of June 30, 2017

	Active Participants	Leave of Absence	Vested Terminated	Other Non-Vested	Retired Participants	Disableds	Survivors and Beneficiaries	Alternate Payees[2]	Total
A. Number as of June 30, 2016	3,455	79	2,020	2,915	3,324	31	328	40	12,192
B. Additions	358	3	113	191	190		27	3	885
C. Deletions									
1. Retirements	(107)	(3)	(78)						(188)
2. Disability									-
3. Died with Beneficiary			(1)		(22)				(23)
4. Died without Beneficiary					(58)		(11)		(69)
5. Terminated - Deferred	(101)	(12)							(113)
6. Terminated - Not Vested	(187)	(4)							(191)
7. Refunds	(16)		(25)	(69)					(110)
8. Rehired as Active	112	(25)	(38)	(49)					-
9. Leave of Absence	(103)	103							-
10. Repayment of Refund									-
11. Expired Benefits							(1)		(1)
12. Disability to Retirement						(2)			(2)
D. Data Adjustments[1]	(2)		43	(43)	2		(1)	1	-
E. Total on June 30, 2017	3,409	141	2,034	2,945	3,436	29	342	44	12,380

[1] *Includes members not valued in prior valuation who repaid refunds or otherwise restored prior service.*

[2] *Includes alternate payees of retired participants (42), disabled participants (1), and survivors (1).*

SECTION 3

FUNDING STATUS

Table 8
Actuarial Balance Sheet
as of July 1, 2017
(dollars in thousands)

A.	CURRENT ASSETS (TABLE 1; Line F.4)	$	1,038,467
B.	EXPECTED FUTURE ASSETS		
	1. Present Value of Expected Future Statutory Supplemental Contributions*	$	498,890
	2. Present Value of Future Normal Costs		236,293
	3. Total Expected Future Assets	$	735,183
C.	TOTAL CURRENT AND EXPECTED FUTURE ASSETS	$	1,773,650
D.	TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS	$	1,847,501
E.	CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (D - C)	$	73,851

* *Includes the effect of scheduled employee and employer contribution increases and supplemental state contributions.*

Table 9
Determination of Unfunded Actuarial Accrued Liability (UAAL) and Supplemental Contribution Rate as of July 1, 2017 (dollars in thousands)

	Actuarial Present Value of Projected Benefits	Actuarial Present Value of Future Normal Costs	Actuarial Accrued Liability
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members*			
a. Retirement Benefits	$ 635,767	$ 172,486	$ 463,281
b. Disability Benefits	$ 13,751	$ 5,338	$ 8,413
c. Surviving Spouse and Child Benefits	$ 9,245	$ 3,207	$ 6,038
d. Vested Withdrawals	$ 36,648	$ 41,163	$ (4,515)
e. Refund Liability Due to Death or Withdrawal	$ 2,989	$ 14,099	$ (11,110)
f. Total	$ 698,400	$ 236,293	$ 462,107
2. Deferred Retirements	$ 77,599	$ 0	$ 77,599
3. Former Members without Vested Rights	$ 2,812	$ 0	$ 2,812
4. Annuitants	$ 1,068,690	$ 0	$ 1,068,690
5. Total	$ 1,847,501	$ 236,293	$ 1,611,208
B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)			
1. Actuarial Accrued Liability (A.5)			$ 1,611,208
2. Current Assets (Table 1; Line F.4)			$ 1,038,467
3. Unfunded Actuarial Accrued Liability (B.1 - B.2)			$ 572,741
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE**			
1. Present Value of Future Payrolls Through the Amortization Date of June 30, 2042***			$ 4,440,299
2. Supplemental Contribution Rate (B.3 / C.1)			12.90%

** Includes members on leave of absence.*

*** The amortization of the unfunded actuarial accrued liability (UAAL) using the current amortization method results in initial payments less than the "interest only" payment on the UAAL. Payments less than the interest only amount will result in the UAAL increasing for an initial period of time.*

****Calculated using 8.0% annual investment return rate.*

Table 10
Changes in Unfunded Actuarial Accrued Liability (UAAL)
as of July 1, 2017
(dollars in thousands)

A.	UAAL AT BEGINNING OF YEAR	$	585,210
B.	CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING		
	1. Normal Cost and Expenses	$	24,987
	2. Contributions	$	(58,496)
	3. Interest	$	45,441
	4. Total	$	11,932
C.	EXPECTED UAAL AT END OF YEAR (A + B.4)	$	597,142
D.	INCREASE / (DECREASE) DUE TO ACTUARIAL LOSSES / (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED		
	1. Age and Service Retirements	$	534
	2. Disability Retirements		(62)
	3. Death-in-Service Benefits		128
	4. Withdrawals		(925)
	5. Salary Increases		(145)
	6. Investment Income		(7,976)
	7. Mortality of Annuitants		2,342
	8. Other Items		(10,118)
	9. Total	$	(16,222)
E.	UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C + D.9)	$	580,920
F.	CHANGE IN UAAL DUE TO PLAN AMENDMENTS		-
G.	CHANGE IN UAAL DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS		(8,179)
H.	UAAL AT END OF YEAR (E + F + G)	$	572,741

Table 11
Determination of Contribution Sufficiency
as of July 1, 2017
(dollars in thousands)

	Percent-of-Payroll	Dollar Amount
A. STATUTORY CONTRIBUTIONS - CHAPTER 354A		
1. Employee Contributions	7.50%	$ 21,069
2. Employer Contributions		
a. Regular	6.50%	18,265
b. Additional	3.84%	10,782
3. Supplemental Contribution		
a. 1996 Legislation	0.30%	838
b. 1997 Legislation	1.01%	2,827
c. 2014 Legislation	2.49%	7,000
4. Total	21.64%	$ 60,781
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	6.62%	$ 18,596
b. Disability Benefits	0.19%	535
c. Surviving Spouse and Child Benefits	0.12%	336
d. Vested Withdrawals	1.48%	4,157
e. Refund Liability Due to Death or Withdrawal	0.52%	1,463
f. Total	8.93%	$ 25,087
2. Supplemental Contribution Amortization	12.90%	36,221
3. Allowance for Administrative Expenses	0.33%	927
4. Total	22.16%	$ 62,235
C. CONTRIBUTION SUFFICIENCY / (DEFICIENCY) (A.4 - B.4)	(0.52%)	(1,454)

Projected Annual Payroll for Fiscal Year Beginning on the Valuation Date: $ 280,785

SECTION 4

ACTUARIAL METHODS AND ASSUMPTIONS

Table 12
Actuarial Methods and Assumptions
as of July 1, 2017

I. ACTUARIAL COST METHOD

An Actuarial Cost Method is a set of techniques used by the actuary to develop contribution levels under a retirement plan. The Actuarial Cost Method used in this valuation for all purposes is the Entry Age Actuarial Cost Method. Under this Method, a Normal Cost is developed by amortizing the actuarial value of benefits expected to be received by each active participant (as a level percentage of pay) over the total working lifetime of that participant, from hire to termination. Years of Service for valuation purposes was provided by the Retirement Fund. Age as of the valuation date was calculated based on the dates of birth provided by the Retirement Fund. Entry Age for valuation purposes was calculated as the age on the valuation date minus the years of service on the valuation date.

To the extent that current assets and future Normal Costs do not support participants' expected future benefits, an Unfunded Actuarial Accrued liability (“UAAL”) develops. The UAAL is amortized over the closed statutory amortization period ending June 30, 2042 using level percent-of-payroll assuming payroll increases of 4.00% per annum. The total contribution developed under this method is the sum of the Normal Cost and the payment toward the UAAL.

II. CURRENT ACTUARIAL ASSUMPTIONS

The assumptions were last updated for the July 1, 2017 valuation as a result of an analysis of Combined Service Annuity assumptions completed by the LCPR Actuary and documented in a report dated October 2016. Other assumptions are based on an experience study for the five-year period of July 1, 2006 to June 30, 2011, as well as a legislated change to the investment return assumption effective July 1, 2015.

An experience study for the 2011 to 2016 period is currently in process. This report recommends many changes to demographic assumptions, expected to be effective at a future date.

A. Demographic Assumptions

Mortality:

1. Healthy Mortality*:
    a. Male: RP-2000 Combined Mortality Table for males projected with Scale AA to 2020 set back 1 year
    b. Female: RP-2000 Combined Mortality Table for females projected with Scale AA to 2020 set back 3 years
2. Disabled Mortality:
    a. Male: RP-2000 Disabled Life Mortality Table for males
    b. Female: RP-2000 Disabled Life Mortality Table for females

* *Mortality rates were adjusted to include margin for future mortality improvement as described in the table name above.*

Table 12
Actuarial Methods and Assumptions
as of July 1, 2017

Deaths Expressed as the Number of Occurrences per 10,000:

	Healthy Mortality		Disabled Mortality	
Age	**Male**	**Female**	**Male**	**Female**
20	2	1	226	75
21	2	1	226	75
22	2	1	226	75
23	3	1	226	75
24	3	1	226	75
25	3	1	226	75
26	3	1	226	75
27	3	1	226	75
28	3	2	226	75
29	4	2	226	75
30	4	2	226	75
31	4	2	226	75
32	5	2	226	75
33	5	2	226	75
34	6	3	226	75
35	6	3	226	75
36	7	3	226	75
37	8	4	226	75
38	8	4	226	75
39	9	4	226	75
40	9	4	226	75
41	9	5	226	75
42	10	5	226	75
43	10	5	226	75
44	10	6	226	75

Table 12
Actuarial Methods and Assumptions
as of July 1, 2017

Deaths Expressed as the Number of Occurrences per 10,000:

	Healthy Mortality		Disabled Mortality	
Age	Male	Female	Male	Female
45	11	6	226	75
46	12	7	238	82
47	12	8	251	90
48	13	8	264	98
49	13	9	277	106
50	14	9	290	115
51	15	10	303	125
52	17	11	316	135
53	18	12	329	145
54	19	13	342	155
55	21	15	354	165
56	25	17	367	176
57	29	20	380	187
58	33	23	393	197
59	38	27	407	208
60	43	31	420	218
61	49	35	435	229
62	57	40	450	241
63	65	46	466	253
64	76	53	483	266
65	85	60	502	280
66	96	69	522	296
67	111	78	545	313
68	124	88	569	332
69	135	99	596	353

Table 12
Actuarial Methods and Assumptions
as of July 1, 2017

Rates of Disability:

Disability Expressed as the Number of Occurrences per 10,000:

Age	Disability	Age	Disability
20	2	45	5
21	2	46	5
22	2	47	5
23	2	48	5
24	2	49	5
25	2	50	10
26	2	51	10
27	2	52	10
28	2	53	10
29	2	54	10
30	3	55	20
31	3	56	20
32	3	57	20
33	3	58	20
34	3	59	20
35	3	60	40
36	3	61	40
37	3	62	40
38	3	63	40
39	3	64	40
40	3		
41	3		
42	3		
43	3		
44	3		

Table 12
Actuarial Methods and Assumptions
as of July 1, 2017

Rates of Termination:

Years of Service	Number of Terminations per 1,000 Active Members Male	Female
0	400	400
1	180	180
2	140	140
3	100	100
4	60	67
5	50	59
6	45	51
7	41	43
8	37	35
9	33	31
10	29	27
11	25	23
12	20	19
13	20	15
14	20	13
15 & Over	20	13

Rates of Retirement:

Retirements Expressed as the Number of Occurrences per 10,000:

Age	Basic Members Eligible for Rule of 90 Provision	Basic Members Not Eligible for Rule of 90 Provision	Male Coordinated Members Eligible for Rule of 90 Provision	Female Coordinated Members Eligible for Rule of 90 Provision	Male Coordinated Members Not Eligible for Rule of 90 Provision	Female Coordinated Members Not Eligible for Rule of 90 Provision
55	5,000	800	3,500	3,500	700	500
56	5,000	1,300	3,500	3,500	700	500
57	4,000	1,300	3,500	3,500	700	500
58	4,000	1,800	3,500	3,500	700	500
59	3,500	1,800	3,500	3,500	700	500
60	3,500	2,000	3,500	3,500	1,100	800
61	3,500	2,000	3,500	3,500	1,500	1,100
62	3,500	4,000	3,500	3,500	1,900	1,400
63	3,500	4,000	3,500	3,500	2,300	1,900
64	4,000	4,000	3,500	4,000	2,700	2,400
65	5,000	5,000	3,500	5,000	3,100	3,500
66	3,000	5,000	3,500	5,000	3,500	3,500
67	3,000	5,000	3,500	5,000	3,500	3,500
68	3,000	5,000	3,500	5,000	3,500	3,500
69	3,000	5,000	3,500	5,000	3,500	3,500
70 & Over	10,000	10,000	10,000	10,000	10,000	10,000

Table 12
Actuarial Methods and Assumptions
as of July 1, 2017

B. Economic Assumptions

Investment Return Rate: 8.00%

Cost-of-Living Increases: 1.00% per year through 2041; 2.00% beginning 2042; 2.50% beginning 2052.

Wage Inflation: 4.00% per year

Future Salary Increases: In addition to the age-based rates shown below, during the first 15 years of employment, a service-based component of 0.20% x (15-T), where T is completed years of service, is included in the salary increase used.

Annual Salary Increases

Age	Ultimate Rate of Annual Salary Increases	Age	Ultimate Rate of Annual Salary Increases
<22	5.90%	45	4.75%
23	5.85	46	4.70
24	5.80	47	4.65
		48	4.60
25	5.75	49	4.55
26	5.70		
27	5.65	50	4.50
28	5.60	51	4.45
29	5.55	52	4.40
		53	4.35
30	5.50	54	4.30
31	5.45		
32	5.40	55	4.25
33	5.35	56	4.20
34	5.30	57	4.15
		58	4.10
35	5.25	59	4.05
36	5.20		
37	5.15	60 & Over	4.00
38	5.10		
39	5.05		
40	5.00		
41	4.95		
42	4.90		
43	4.85		
44	4.80		

Asset Value: The actuarial value of assets is smoothed by using a five-year average market value.

Table 12
Actuarial Methods and Assumptions
as of July 1, 2017

C. Other Assumptions

Marital Status:	It is assumed that 75% of male members and 60% of female members have an eligible spouse. The male spouse is assumed to be two years older than the female spouse. Married members are assumed to have two dependent children.
Deferred Benefit Commencement:	Basic Plan members who terminate vested are assumed to commence benefits at age 61. Coordinated Plan members are assumed to commence benefits at age 62. If the member is already past the assumed deferral age, the member is assumed to commence benefits one year from the valuation date.
Administrative Expenses:	Prior year administrative expenses (excluding investment expenses) are expressed as a percentage-of-payroll and then applied to current projected payroll.
Refund of Contributions:	All employees withdrawing after becoming eligible for a deferred benefit take the larger of their contributions accumulated with interest or the value of their deferred benefit. Account balances for deferred members accumulate interest until the assumed benefit commencement date and are discounted back to the valuation date.
Allowance for Combined Service Annuity:	20.0% load on liabilities for former, vested members. 9.0% load on liabilities for former, non-vested members.
Missing Salary and Salary Minimums:	Active members with reported salaries of $100 or less were assumed to have the average non-zero active salary. Active members with salaries less than those reported at the prior valuation date are valued using their prior salary amount. Active members who have been hired within one year of the valuation date have had their pay annualized by dividing by months of service credited, not to exceed the average non-zero active salary. For members on leave of absence at valuation date who were not on leave at the prior valuation date, the prior year's valuation pay was used.
Missing Data for Deferred Vested Members:	Deferred vested members without a reported benefit and without salary information were assumed to have a final average salary of $40,000.
Decrement Timing:	Retirement and Termination: end of valuation year – consistent with retirements and terminations occurring at the end of the school year. Death and Disability: middle of valuation year.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Service Credit Accruals:	It is assumed that members accrue one year of service credit per year. Exact fractional service is used to determine the amount of benefit payable.

Table 12
Actuarial Methods and Assumptions
as of July 1, 2017

Valuation of Future Post-Retirement Benefit Increases:	If the plan has reached the funding ratio threshold required to pay a different benefit increase, Minnesota Statutes require the benefit increase rate to be reflected in the liability calculations. If the plan has not yet reached the funding ratio threshold required to pay a benefit increase, Minnesota Statutes require a projection to be performed to determine the expected attainment of the funding ratio thresholds, and the expected payment of benefit increases must be reflected in the liability calculations.
Supplemental Contributions:	1996 legislation provides for a variable amortization aid contribution paid annually on July 15. We assumed the annual amortization aid contribution will equal $838,000, which was the actual contribution for the most recent fiscal year. Additionally, according to 1997 legislation, annual supplemental contributions currently equal to $2,827,000 are scheduled to be paid on October 1. According to 2014 legislation, the State of Minnesota will make annual additional supplemental contributions of $7,000,000 on October 1. The contributions described herein will continue until the plan is 100% funded or until June 30, 2042, whichever occurs earlier.
Projected Annual Payroll Calculation:	The census data as of July 1, 2017 reflects retirements and terminations occurring during the months of May and June; however, it does not necessarily reflect the replacements hired to fill their positions who may have hire dates in August and September. We assumed that May and June retirements are replaced by members coming in at the B.A. entry salary level of $44,759; and the Projected Annual Payroll for the fiscal year ending June 30, 2018 includes this replacement salary amount.
Changes in Actuarial Assumptions Since the Prior Valuation:	The Combined Service Annuity (CSA) loads on liabilities were changed as follows:

	Active Pre-89	Active Post-89	Vested Terminated	Non-Vested Terminated
Prior	7.0%	2.0%	30.0%	30.0%
Current	0.0%	0.0%	20.0%	9.0%

The assumed cost-of-living adjustments were changed from 1.00% per year through 2054; 2.00% beginning 2055; 2.50% beginning 2066 to 1.00% per year through 2041; 2.00% beginning 2042; 2.50% beginning 2052.

SECTION 5

BASIC PLAN

Table 3A
Basic Active Members as of June 30, 2017

	Years of Service								
Age	<5	5-9	10-14	15-19	20-24	25-29	30-34	35+	ALL
<25	0	0	0	0	0	0	0	0	0
25-29	0	0	0	0	0	0	0	0	0
30-34	0	0	0	0	0	0	0	0	0
35-39	0	0	0	0	0	0	0	0	0
40-44	0	0	0	0	0	0	0	0	0
45-49	0	0	0	0	0	0	0	0	0
50-54	0	0	0	0	0	0	0	0	0
55-59	0	0	0	0	0	0	0	0	0
60-64	0	0	0	0	0	0	0	0	0
65+	0	0	0	0	0	0	0	3	3
ALL	0	0	0	0	0	0	0	3	3

AVERAGE ANNUAL EARNINGS

	Years of Service								
Age	<5	5-9	10-14	15-19	20-24	25-29	30-34	35+	ALL
<25	0	0	0	0	0	0	0	0	0
25-29	0	0	0	0	0	0	0	0	0
30-34	0	0	0	0	0	0	0	0	0
35-39	0	0	0	0	0	0	0	0	0
40-44	0	0	0	0	0	0	0	0	0
45-49	0	0	0	0	0	0	0	0	0
50-54	0	0	0	0	0	0	0	0	0
55-59	0	0	0	0	0	0	0	0	0
60-64	0	0	0	0	0	0	0	0	0
65+	0	0	0	0	0	0	0	128,291	128,291
ALL	0	0	0	0	0	0	0	128,291	128,291

	Prior Fiscal Year Earnings (IN THOUSANDS) by Years of Service								
	<5	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	ALL
ALL	0	0	0	0	0	0	0	385	385

Table 4A
Basic Service Retirements as of June 30, 2017

	Years Retired									
Age	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	0	0	0	1	0	0	0	0	0	1
45-49	0	0	0	1	0	0	0	0	0	1
50-54	2	0	0	0	0	0	0	0	0	2
55-59	3	0	0	0	0	0	0	0	0	3
60-64	20	23	0	0	0	0	0	0	0	43
65-69	24	104	161	1	0	0	0	0	0	290
70-74	3	53	203	151	3	0	0	0	0	413
75-79	0	4	39	161	99	1	0	0	0	304
80-84	0	0	3	63	147	41	0	0	0	254
85-89	0	0	0	1	61	53	43	0	0	158
90+	0	0	0	1	5	23	42	14	0	85
ALL	52	184	406	380	315	118	85	14	0	1,554

AVERAGE ANNUAL BENEFIT

	Years Retired									
Age	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	0	0	0	5,768	0	0	0	0	0	5,768
45-49	0	0	0	5,768	0	0	0	0	0	5,768
50-54	5,194	0	0	0	0	0	0	0	0	5,194
55-59	8,127	0	0	0	0	0	0	0	0	8,127
60-64	36,804	42,570	0	0	0	0	0	0	0	39,888
65-69	35,955	48,123	43,233	5,767	0	0	0	0	0	44,255
70-74	41,917	44,496	44,246	36,088	54,471	0	0	0	0	41,353
75-79	0	51,586	52,113	44,803	44,244	67,960	0	0	0	45,724
80-84	0	0	67,521	50,539	47,355	29,213	0	0	0	45,455
85-89	0	0	0	9,938	58,008	38,321	35,289	0	0	44,917
90+	0	0	0	40,511	54,694	36,398	26,350	24,884	0	30,661
ALL	33,837	46,459	44,772	41,880	48,625	35,033	30,872	24,884	0	43,001

	Total Annual Benefit (IN THOUSANDS) by Years RETIRED									
	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
ALL	1,760	8,548	18,178	15,915	15,317	4,134	2,624	348	0	66,824

Table 5A
Basic Disability Retirements as of June 30, 2017*

	Years Disabled									
Age	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	0	0	0	0	0	0	0	0	0	0
45-49	0	0	0	0	0	0	0	0	0	0
50-54	0	0	0	0	0	0	0	0	0	0
55-59	0	0	0	0	0	0	0	0	0	0
60-64	0	2	0	0	0	0	0	0	0	2
65-69	0	0	0	0	0	0	0	0	0	0
70-74	0	0	0	0	0	0	0	0	0	0
75-79	0	0	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	0	0	0	0	0
85-89	0	0	0	0	0	0	0	0	0	0
90+	0	0	0	0	0	0	0	0	0	0
ALL	0	2	0	0	0	0	0	0	0	2

AVERAGE ANNUAL BENEFIT

	Years Disabled									
Age	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	0	0	0	0	0	0	0	0	0	0
45-49	0	0	0	0	0	0	0	0	0	0
50-54	0	0	0	0	0	0	0	0	0	0
55-59	0	0	0	0	0	0	0	0	0	0
60-64	0	52,566	0	0	0	0	0	0	0	52,566
65-69	0	0	0	0	0	0	0	0	0	0
70-74	0	0	0	0	0	0	0	0	0	0
75-79	0	0	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	0	0	0	0	0
85-89	0	0	0	0	0	0	0	0	0	0
90+	0	0	0	0	0	0	0	0	0	0
ALL	0	52,566	0	0	0	0	0	0	0	52,566

	Total Annual Benefit (IN THOUSANDS) by Years DISABLED									
	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
ALL	0	105	0	0	0	0	0	0	0	105

** Disability benefits convert to normal retirement benefits at normal retirement age (which occurs between ages 65 and 66).*

Table 6A
Basic Survivors as of June 30, 2017

Age	Years Since Member Death <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	0	0	0	0	0	0	0	0	0	0
45-49	0	0	1	0	0	0	0	0	0	1
50-54	0	0	0	0	0	0	0	0	0	0
55-59	3	0	0	0	0	0	0	0	0	3
60-64	1	0	0	4	1	0	0	0	1	7
65-69	3	0	2	4	1	3	0	1	0	14
70-74	10	0	3	7	7	3	1	0	0	31
75-79	13	0	0	7	19	5	5	2	0	51
80-84	27	0	1	7	15	20	11	1	0	82
85-89	10	0	1	0	5	13	17	4	3	53
90+	3	0	0	0	1	6	21	7	2	40
ALL	70	0	8	29	49	50	55	15	6	282

AVERAGE ANNUAL BENEFIT

Age	Years Since Member Death <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	0	0	0	0	0	0	0	0	0	0
45-49	0	0	824	0	0	0	0	0	0	824
50-54	0	0	0	0	0	0	0	0	0	0
55-59	34,538	0	0	0	0	0	0	0	0	34,538
60-64	60,779	0	0	10,134	49,403	0	0	0	3,350	22,010
65-69	29,952	0	66,084	27,725	39,541	37,479	0	20,582	0	36,106
70-74	47,252	0	27,185	30,430	37,066	20,582	24,598	0	0	35,900
75-79	39,707	0	0	42,229	41,915	30,759	28,554	21,887	0	38,206
80-84	49,582	0	65,158	30,794	47,439	37,038	26,356	17,625	0	41,211
85-89	41,084	0	40,687	0	46,305	40,215	35,810	24,042	32,385	37,885
90+	23,194	0	0	0	54,745	43,978	32,400	26,073	26,480	32,602
ALL	43,744	0	40,049	30,193	43,727	37,108	31,754	24,044	25,577	37,293

Total Annual Benefit (IN THOUSANDS) by Years Since Member Death

	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
ALL	3,062	0	321	876	2,143	1,855	1,746	361	153	10,517

Table 11A
Basic Determination of Contribution Sufficiency
as of July 1, 2017
(dollars in thousands)

	Percent-of-Payroll	Dollar Amount
A. STATUTORY CONTRIBUTIONS - CHAPTER 354A		
1. Employee Contributions	10.00%	$ 40
2. Employer Contributions		
a. Regular	10.00%	40
b. Additional	3.64%	15
3. Supplemental Contribution		
a. 1996 Legislation	0.30%	1
b. 1997 Legislation	1.01%	4
c. 2014 Legislation	2.49%	10
4. Total	27.44%	$ 110
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	8.75%	$ 35
b. Disability Benefits	0.42%	2
c. Surviving Spouse and Child Benefits	0.09%	0
d. Deferred Retirements	1.70%	7
e. Refund Liability Due to Death or Withdrawal	1.14%	5
f. Total	12.10%	$ 49
Projected Annual Payroll for Fiscal Year Beginning on the Valuation Date:		$ 400

Summary of Benefit Provisions for Basic Members as of July 1, 2017

STATUTORY CONTRIBUTIONS

Statutory contribution rates for members and their employers are shown as a percent of pay below:

Contribution After June 30,	Member	Employer Regular	Employer Additional
2014	9.00%	9.00%	3.64%
2015	9.50%	9.50%	3.64%
2016	10.00%	9.75%	3.64%
2017	10.00%	10.00%	3.64%

PARTICIPANTS

Professional Educators first employed prior to July 1, 1978 by schools in the City of St. Paul or St. Paul College whose position requires a license from the Minnesota Department of Education, who are not covered under the Social Security Act.

ACCREDITED SERVICE

Service which has been verified and accredited by the Association for the purpose of determining contributions and benefits (may include service earned while working outside of St. Paul Public Schools, previous St. Paul service, military service and governmental service).

ALLOWABLE ST. PAUL SERVICE

Service earned as a licensed educator in the St. Paul Public Schools, in the St. Paul College, or as an employee of the Association. Also includes service credited after receipt of payment as required, for licensed educators on leave.

SALARY

Total compensation earned during a school year (July 1 to June 30) excluding lump sum payments for unused leave at termination and employer-paid insurance coverage.

AVERAGE SALARY

Average of the highest five years of salary during the last 10 years of St. Paul service while making contributions or while disabled.

Summary of Benefit Provisions for Basic Members as of July 1, 2017

NORMAL RETIREMENT BENEFIT

Eligibility

Attainment of age 65 and 5 years of Accredited Service.

Benefit

2.50% of Average Salary for each year of Accredited Service.

EARLY RETIREMENT BENEFIT

Eligibility

Attainment of age 55 and 5 years of Accredited Service.

Benefit

The greater of the following benefits:

- 2.00 percent of Average Salary per year of Accredited Service, subject to a maximum of 40 years with a 0.25% reduction for each month the member is under age 65. If the member has 25 years of Accredited Service, the reduction is taken from age 60, therefore no reduction is required if the member is age 60 or older. No reduction is taken if age plus years of Accredited Service totals at least 90.

- 2.50 percent of Average Salary per year of Accredited Service, subject to a maximum of 40 years, reduced for each month the member is under age 65 using linear interpolation of the table listed below.

Age at Retirement	Under Age 62 or Less Than 30 Years of Service	Age 62 or Older with 30 Years of Service
55	0.5376	
56	0.5745	
57	0.6092	
58	0.6419	
59	0.6726	
60	0.7354	
61	0.7947	
62	0.8507	0.8831
63	0.9035	0.9246
64	0.9533	0.9635
65	1.0000	1.0000

Summary of Benefit Provisions for Basic Members as of July 1, 2017

DISABILITY RETIREMENT BENEFIT

Eligibility

Total and permanent disablement before attaining age 65 and 5 years of Accredited Service.

Benefit

If the member is under age 65, 75 percent of the member's annual contract salary less any Social Security and Workers' Compensation benefits payable until age 65. At age 65, a normal retirement benefit is calculated using the projected service and average salary as if the member had continued to teach in their position held at the time of disability. Members age 65 or older at time of disability receive a normal retirement benefit.

DEFERRED RETIREMENT BENEFIT

Eligibility

5 years of Accredited Service.

Benefit

Benefit computed under law in effect at termination and payable as a normal or early retirement benefit. For members hired on or before June 30, 2006, the benefit is augmented at 3.00 percent compounded annually from the 1st of the month following termination until the January 1st after turning age 55 and then augmented at 5.00 percent compounded annually from that date to July 1, 2012. For members hired after June 30, 2006, the benefit is augmented at 2.50 percent compounded annually from the 1st of the month following termination to July 1, 2012. Augmentation for all members, regardless of hire date, changed to 2.00 percent as of July 1, 2012 for the portion of benefit deferral which occurs after June 30, 2012.

ACTIVE SURVIVOR BENEFIT (Family Benefit)

Eligibility

Active member with three years of Accredited Service.

Benefit

- Children's Benefit: 25 percent of the maximum Bachelor of Arts salary for the year in which the member died for each eligible child up to a maximum of two. Benefits are paid until the child attains age 18, or 22 for full-time students.
- Spousal Benefit: 15 percent of the maximum Bachelor of Arts salary for an eligible spouse who has legal custody of an eligible child. Spousal benefits cease when the spouse remarries, dies, or elects the regular survivor benefit. Electing the regular survivor benefit does not disqualify the child from receiving the family benefit.

Summary of Benefit Provisions for Basic Members as of July 1, 2017

SURVIVOR BENEFIT (Active or Retired Member)

Eligibility

Active member or retired member with five years of Accredited Service. A surviving spouse must have been married to the member for three years at the earlier of his death or retirement.

Benefit

Retirement benefit earned at the time of death or retirement, whichever is earlier, reduced by the use of one hundred percent joint survivorship tables, based on the ages of the member and survivor at the time of retirement.

REFUND OF CONTRIBUTIONS

Eligibility

Termination or death where no annuity is payable, or prior to age 55, if a refund of contributions is chosen in lieu of an annuity.

Benefit

Member contributions with 6.00 percent interest accrued before July 1, 2011 with 4.00 percent accrual thereafter.

REEMPLOYED ANNUITANTS

The School District shall make the regular employer contribution and additional employer contribution, plus a supplemental contribution equal to 2.5% of salary, on behalf of any retired member who is reemployed by the School District. Reemployed annuitants do not accrue additional benefits.

NORMAL FORM OF RETIREMENT BENEFITS

Unreduced annuity payments made until the death of the member, with a 100 percent Joint & Survivor adjusted pension payable to the surviving beneficiary.

BENEFIT INCREASES

If the Accrued Liability Funding Ratio, based on Actuarial Value of Assets, as determined by the two consecutive and most recent actuarial valuations are:

Less than 80 percent for two consecutive years, the COLA: 1.00 percent
Between 80 percent and 90 percent for two consecutive years, the COLA: 2.00 percent
If at least 90 percent for two consecutive years, the COLA: 2.50 percent

CHANGES IN PLAN PROVISIONS

There have been no changes in plan provisions since the prior valuation.

SECTION 6

COORDINATED PLAN

Table 3B
Coordinated Active Members as of June 30, 2017*

Age	Years of Service <5	5-9	10-14	15-19	20-24	25-29	30-34	35+	ALL
<25	25	0	0	0	0	0	0	0	25
25-29	222	32	0	0	0	0	0	0	254
30-34	224	179	18	0	0	0	0	0	421
35-39	172	135	161	30	0	0	0	0	498
40-44	143	73	116	196	23	0	0	0	551
45-49	86	54	77	167	182	9	0	0	575
50-54	63	36	48	95	131	78	18	1	470
55-59	48	22	33	85	84	93	71	4	440
60-64	19	7	26	43	61	45	26	20	247
65+	18	8	7	11	7	7	6	2	66
ALL	1,020	546	486	627	488	232	121	27	3,547

AVERAGE ANNUAL EARNINGS

Age	Years of Service <5	5-9	10-14	15-19	20-24	25-29	30-34	35+	ALL
<25	38,643	0	0	0	0	0	0	0	38,643
25-29	47,432	59,694	0	0	0	0	0	0	48,977
30-34	52,705	65,399	74,175	0	0	0	0	0	59,019
35-39	56,047	73,033	79,672	81,543	0	0	0	0	69,825
40-44	56,017	73,541	79,264	84,135	92,605	0	0	0	74,761
45-49	59,784	75,378	81,219	86,468	92,254	92,297	0	0	82,655
50-54	48,462	74,341	77,759	87,865	88,789	96,571	100,457	129,371	82,788
55-59	37,842	74,828	79,544	85,492	88,773	94,457	98,139	81,407	83,839
60-64	34,687	76,065	73,828	79,803	87,721	91,769	90,852	105,172	82,950
65+	16,527	29,648	49,712	75,328	83,588	98,576	86,872	102,509	56,252
ALL	50,902	69,610	78,674	84,930	90,050	94,687	96,359	102,350	73,794

	Prior Fiscal Year Earnings (In THOUSANDS) by Years of Service <5	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	ALL
ALL	51,920	38,007	38,236	53,251	43,944	21,967	11,659	2,763	261,748

Including those on leave of absence; pay annualized for new hires.

Table 4B
Coordinated Service Retirements as of June 30, 2017

	Years Retired									
Age	**<5**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**	**40 & Over**	**ALL**
<45	0	0	0	0	0	0	0	0	0	0
45-49	0	0	0	0	0	0	0	0	0	0
50-54	1	0	0	0	0	0	0	0	0	1
55-59	88	2	0	0	0	0	0	0	0	90
60-64	289	99	0	0	0	0	0	0	0	388
65-69	337	262	61	0	0	0	0	0	0	660
70-74	75	204	135	39	1	0	0	0	0	454
75-79	10	25	89	60	18	0	0	0	0	202
80-84	4	7	13	39	25	1	0	0	0	89
85-89	0	0	3	4	18	2	0	0	0	27
90+	0	0	1	1	2	3	5	1	0	13
ALL	804	599	302	143	64	6	5	1	0	1,924

AVERAGE ANNUAL BENEFIT

	Years Retired									
Age	**<5**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**	**40 & Over**	**ALL**
<45	0	0	0	0	0	0	0	0	0	0
45-49	0	0	0	0	0	0	0	0	0	0
50-54	28,825	0	0	0	0	0	0	0	0	28,825
55-59	18,987	3,662	0	0	0	0	0	0	0	18,646
60-64	24,378	21,463	0	0	0	0	0	0	0	23,635
65-69	18,411	19,827	16,416	0	0	0	0	0	0	18,789
70-74	14,650	18,880	19,182	11,505	20,132	0	0	0	0	17,640
75-79	2,292	15,213	17,504	14,613	13,853	0	0	0	0	15,283
80-84	8,132	8,438	10,044	13,986	16,668	6,601	0	0	0	13,381
85-89	0	0	1,367	21,283	21,091	4,484	0	0	0	17,698
90+	0	0	32,392	23,358	43,384	13,410	5,968	3,946	0	16,657
ALL	20,030	19,395	17,602	13,842	18,009	9,300	5,968	3,946	0	18,846

	Total Annual Benefit (IN THOUSANDS) by Years RETIRED									
	<5	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**	**40 & Over**	**ALL**
ALL	16,104	11,618	5,316	1,979	1,153	56	30	4	0	36,260

Table 5B
Coordinated Disability Retirements as of June 30, 2017*

Age	Years Disabled <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	1	0	0	0	0	0	0	0	0	1
45-49	1	1	0	0	0	0	0	0	0	2
50-54	3	3	0	0	0	0	0	0	0	6
55-59	2	2	1	0	1	0	0	0	0	6
60-64	4	5	2	1	0	0	0	0	0	12
65-69	0	0	0	1	0	0	0	0	0	1
70-74	0	0	0	0	0	0	0	0	0	0
75-79	0	0	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	0	0	0	0	0
85-89	0	0	0	0	0	0	0	0	0	0
90+	0	0	0	0	0	0	0	0	0	0
ALL	11	11	3	2	1	0	0	0	0	28

AVERAGE ANNUAL BENEFIT

Age	Years Disabled <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	3,490	0	0	0	0	0	0	0	0	3,490
45-49	34,015	7,875	0	0	0	0	0	0	0	20,945
50-54	22,199	13,960	0	0	0	0	0	0	0	18,079
55-59	19,568	8,936	24,916	0	5,694	0	0	0	0	14,603
60-64	30,799	13,535	8,852	28,002	0	0	0	0	0	19,715
65-69	0	0	0	9,869	0	0	0	0	0	9,869
70-74	0	0	0	0	0	0	0	0	0	0
75-79	0	0	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	0	0	0	0	0
85-89	0	0	0	0	0	0	0	0	0	0
90+	0	0	0	0	0	0	0	0	0	0
ALL	24,221	12,300	14,206	18,936	5,694	0	0	0	0	17,426

Total Annual Benefit (IN THOUSANDS) by Years DISABLED

	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
ALL	266	135	43	38	6	0	0	0	0	488

** Disability benefits convert to normal retirement benefits at normal retirement age (which occurs between ages 65 and 66).*

Table 6B
Coordinated Survivors as of June 30, 2017

Age	Years Since Member Death <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	5	2	0	0	0	0	0	0	0	7
45-49	0	0	2	0	0	0	0	0	0	2
50-54	1	0	2	0	0	0	0	0	0	3
55-59	1	3	0	0	0	0	0	0	0	4
60-64	3	4	0	1	0	0	0	0	0	8
65-69	6	0	2	0	1	0	0	0	0	9
70-74	4	2	3	6	0	0	0	0	0	15
75-79	0	0	3	4	1	0	0	0	0	8
80-84	1	0	0	2	0	1	0	0	0	4
85-89	1	0	0	0	0	0	0	0	0	1
90+	0	0	0	0	0	0	0	0	0	0
ALL	22	11	12	13	2	1	0	0	0	61

AVERAGE ANNUAL BENEFIT

Age	Years Since Member Death <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
<45	22,513	7,493	0	0	0	0	0	0	0	18,222
45-49	0	0	683	0	0	0	0	0	0	683
50-54	1,940	0	824	0	0	0	0	0	0	1,196
55-59	39,866	8,029	0	0	0	0	0	0	0	15,988
60-64	15,398	13,800	0	701	0	0	0	0	0	12,762
65-69	20,761	0	19,553	0	13,752	0	0	0	0	19,714
70-74	15,800	25,454	21,064	10,676	0	0	0	0	0	16,090
75-79	0	0	16,965	16,004	17,259	0	0	0	0	16,522
80-84	15,733	0	0	29,650	0	26,876	0	0	0	25,477
85-89	888	0	0	0	0	0	0	0	0	888
90+	0	0	0	0	0	0	0	0	0	0
ALL	18,407	13,198	13,017	14,467	15,505	26,876	0	0	0	15,612

	Total Annual Benefit (IN THOUSANDS) by Years Since Member Death <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	ALL
ALL	405	145	156	188	31	27	0	0	0	952

Table 11B
Coordinated Determination of Contribution Sufficiency as of July 1, 2017 (dollars in thousands)

	Percent-of-Payroll	Dollar Amount
A. STATUTORY CONTRIBUTIONS - CHAPTER 354A		
1. Employee Contributions	7.50%	$ 21,029
2. Employer Contributions		
a. Regular	6.50%	18,225
b. Additional	3.84%	10,767
3. Supplemental Contribution		
a. 1996 Legislation	0.30%	837
b. 1997 Legislation	1.01%	2,823
c. 2014 Legislation	2.49%	6,990
4. Total	21.64%	$ 60,671
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	6.62%	$ 18,561
b. Disability Benefits	0.19%	533
c. Surviving Spouse and Child Benefits	0.12%	336
d. Deferred Retirements	1.48%	4,150
e. Refund Liability Due to Death or Withdrawal	0.52%	1,458
f. Total	8.93%	$ 25,038
Projected Annual Payroll for Fiscal Year Beginning on the Valuation Date:		$ 280,385

Summary of Benefit Provisions for Coordinated Members as of July 1, 2017

STATUTORY CONTRIBUTIONS

Statutory contribution rates for members and their employers are shown as a percent-of-pay below.

Contribution After June 30,	Member	Employer Regular	Employer Additional
2014	6.50%	5.50%	3.84%
2015	7.00%	6.00%	3.84%
2016	7.50%	6.25%	3.84%
2017	7.50%	6.50%	3.84%

PARTICIPANTS

Professional educators in the public schools of the City of St. Paul, excluding charter schools, whose position requires a license from the Minnesota Department of Education, and who are covered under the Social Security Act and make contributions to the St. Paul Teachers' Retirement Fund Association, are covered under the Coordinated Plan.

ALLOWABLE SERVICE

Service earned as a licensed educator in the St. Paul Public Schools, in the St. Paul College, or in certain charter schools, or as an employee of the Association. Also includes service credited after receipt of payment as required, for licensed educators on leave. Service is granted on a proportional basis for part-time teachers.

SALARY

Total compensation excluding lump sum payments for unused leave at termination and employer-paid insurance coverage.

AVERAGE SALARY

Average of the highest five successive years of salary while making contributions. In cases where the Allowable Service is less than five years, Average Salary is based on the Allowable Service years.

NORMAL RETIREMENT BENEFIT

Eligibility

Three years of Allowable Service. The eligibility age is 65 for those hired before July 1, 1989 and the earlier of eligibility for full Social Security retirement benefits to a maximum of age 66 for those hired on or after July 1, 1989. A Proportionate Retirement Annuity is available at Normal Retirement Age with one year of Allowable Service.

Benefit

1.70 percent of Average Salary for each year of Allowable Service rendered before July 1, 2015 and 1.90 percent of Average Salary for each year of Allowable Service rendered after June 30, 2015.

Summary of Benefit Provisions for Coordinated Members as of July 1, 2017

EARLY RETIREMENT BENEFIT

Eligibility

Attainment of age 55 and 3 years of Allowable Service.

Benefit

Members hired before July 1, 1989 are eligible for the greater of the following benefits. Members hired after July 1, 1989 are eligible for the benefits shown in item (b):

a) For the first ten years of Allowable Service, 1.20 percent of Average Salary for each year of Allowable Service rendered prior to July 1, 2015, plus 1.40 percent of Average Salary for each year of Allowable Service rendered after June 30, 2015. Additionally, for each subsequent year of Allowable Service in excess of ten years, 1.70 percent of Average Salary for each year rendered prior to July 1, 2015, plus 1.90 percent of Average Salary for each year rendered after June 30, 2015. There is a reduction of 0.25 percent for each month the member is under age 65, or under age 62 with 30 years of Allowable Service. No reduction applies if the age plus years of service totals at least 90.

b) 1.70 percent of Average Salary per year of Allowable Service rendered before July 1, 2015 and 1.90 percent of Average Salary for each year of service rendered after June 30, 2015 reduced for each month the member is under the Normal Retirement Age using linear interpolation of the factors in the table listed below.

	Under Age 62 or Less Than 30 Years of Service		Age 62 or Older with 30 Years of Service	
Normal Retirement Age:	**65**	**66**	**65**	**66**
Age at Retirement				
55	0.5376	0.4592		
56	0.5745	0.4992		
57	0.6092	0.5370		
58	0.6419	0.5726		
59	0.6726	0.6062		
60	0.7354	0.6726		
61	0.7947	0.7354		
62	0.8507	0.7947	0.8831	0.8389
63	0.9035	0.8507	0.9246	0.8831
64	0.9533	0.9035	0.9635	0.9246
65	1.0000	0.9533	1.0000	0.9635
66		1.0000		1.0000

Summary of Benefit Provisions for Coordinated Members as of July 1, 2017

DISABILITY RETIREMENT BENEFIT

Eligibility

Total and permanent disablement and three years of Allowable Service with service earned within the current fiscal year and at least two years of Allowable Service since the last interruption in service.

Benefit

Calculated as a normal retirement benefit payable for life without reduction for early commencement. At normal retirement age, the benefit converts from a disability benefit to a retirement benefit. The disability benefit is reduced by any Workers' Compensation benefits payable.

DEFERRED RETIREMENT BENEFIT

Eligibility

Three years of Allowable Service.

Benefit

Benefit computed under law in effect at termination and payable as a normal or early retirement benefit. For members hired on or before June 30, 2006, the benefit is augmented at 3.00 percent compounded annually from the 1st of the month following termination until the January 1st after turning age 55 and then augmented at 5.00 percent compounded annually from that date to July 1, 2012. For members hired after June 30, 2006, the benefit is augmented at 2.50 percent compounded annually from the 1st of the month following termination to July 1, 2012. Augmentation for all members, regardless of hire date, changed to 2.00 percent as of July 1, 2012 for the portion of benefit deferral which occurs after June 30, 2012.

SURVIVOR BENEFIT (Active Members)

Eligibility

Active member with three years of Allowable service. A surviving spouse is defined as the person legally married to the member at the time of death. If none, a dependent child who is the legal child of the member, who is less than 20 years of age and unmarried.

Benefit

Retirement benefit earned at the time of death with choices for either a reduced for 100 percent joint survivorship, or 5-, 10-, 15-, or 20-year term certain. The benefit is available immediately upon application. Actuarial reductions assuming 2.5% augmentation for the calculation of the survivorship portion of a 100 percent joint and survivor benefit are actuarially determined based on the member's and survivor's ages at the death of the member.

Early retirement reductions apply to the survivor benefit based on the member's age when deceased. If the deceased member had not yet attained age 55 at time of death, the additional early retirement reduction from age 55 to the age of the member at death applies at only one-half of the actuarial rate.

Summary of Benefit Provisions for Coordinated Members as of July 1, 2017

REFUND OF CONTRIBUTIONS

Eligibility

Termination or death where no annuity is payable or a refund of contributions is chosen in lieu of an annuity.

Benefit

Member contributions with 6.00 percent interest accrued until July 1, 2011 with 4.00 percent accrual thereafter.

REEMPLOYED ANNUITANTS

The School District shall make the regular employer contribution and additional employer contribution, plus a supplemental contribution equal to 2.5% of salary, on behalf of any retired member who is reemployed by the School District. Reemployed annuitants do not accrue additional benefits.

NORMAL FORM OF RETIREMENT BENEFITS

Straight life annuity. Actuarially equivalent options are available to provide post-retirement beneficiary or survivor benefits.

BENEFIT INCREASES

If the Accrued Liability Funding Ratio, based on Actuarial Value of Assets, as determined by the two consecutive and most recent actuarial valuations are:

Less than 80 percent for two consecutive years, the COLA: 1.00 percent
Between 80 percent and 90 percent for two consecutive years, the COLA: 2.00 percent
If at least 90 percent for two consecutive years, the COLA: 2.50 percent

CHANGES IN PLAN PROVISIONS

There have been no changes in plan provisions since the prior valuation.

SECTION 7

ADDITIONAL DISCLOSURES

Table 14
Additional Disclosures – Schedule of Funding Progress
(dollars in thousands)

Actuarial Valuation Date	Actuarial Value of Assets (A)	Actuarial Accrued Liability (B)	Unfunded AAL (UAAL) (B)-(A)	Funded Ratio (A)/(B)	Actual Covered Payroll (Previous FY) (C)	UAAL as % of Covered Payroll ((B)-(A))/(C)
07/01/96	$ 494,931	$ 664,072	$ 169,141	74.53%	$ 145,677	116.11%
07/01/97	556,406	805,066	248,660	69.11%	151,363	164.28%
07/01/98	625,053	861,584	236,531	72.55%	168,564	140.32%
07/01/99	704,233	938,847	234,614	75.01%	178,254	131.62%
07/01/00	801,823	998,253	196,430	80.32%	187,950	104.51%
07/01/01	869,045	1,060,931	191,886	81.91%	202,915	94.56%
07/01/02	899,572	1,141,300	241,728	78.82%	201,456	119.99%
07/01/03	898,760	1,189,361	290,601	75.57%	205,655	141.31%
07/01/04	898,860	1,251,460	352,600	71.82%	221,685	159.05%
07/01/05	905,292	1,299,832	394,540	69.65%	223,762	176.32%
07/01/06	938,919	1,346,072	407,153	69.75%	226,351	179.88%
07/01/07	1,015,722	1,380,151	364,429	73.59%	229,172	159.02%
07/01/08	1,075,951	1,432,040	356,089	75.13%	235,993	150.89%
07/01/09	1,049,954	1,454,314	404,360	72.20%	243,166	166.29%
07/01/10	1,001,444	1,471,630	470,185	68.05%	239,996	195.91%
07/01/11	972,718	1,389,875	417,157	69.99%	239,738	174.01%
07/01/12	911,930	1,471,216	559,286	61.98%	239,053	233.96%
07/01/13	886,296	1,467,350	581,054	60.40%	247,432	234.83%
07/01/14	947,972	1,533,603	585,631	61.81%	259,740	225.47%
07/01/15	999,736	1,596,770	597,034	62.61%	263,844	226.28%
07/01/16	1,007,360	1,592,570	585,210	63.25%	258,787	226.14%
07/01/17	1,038,467	1,611,208	572,741	64.45%	264,342	216.67%

Table 15
Additional Disclosures – Schedule of Employer Contributions (dollars in thousands)

Year Ended June 30	Actuarially Required Contribution Rate (A)	Actual Covered Payroll (B)	Actual Member Contributions (C)	Annual Required Contributions (D) = [(A)*(B)]-(C)	Actual Employer Contributions [1] (E)	Percentage Contributed (E) / (D)
1997	16.97%	$ 151,363	$ 9,484	$ 16,202	$ 16,043	99.02%
1998	20.35%	168,564	11,057	23,246	21,702	93.36
1999	18.82%	178,254	11,649	21,898	21,066	96.20
2000	18.09%	187,950	13,184	20,816	22,622	108.68
2001	16.57%	202,915	13,170	20,453	23,569	115.23
2002	15.81%	201,456	14,468	17,382	24,216	139.32
2003	18.56% [2]	205,655	14,222	23,948	23,370	97.59
2004	20.36%	221,685	14,308	30,827	23,771	77.11
2005	21.59%	223,762	13,587	34,723	23,833	68.64
2006	23.78%	226,351	13,453	40,373	24,015	59.48
2007	24.55%	229,172	13,438	42,823	24,117	56.32
2008	23.40%	235,993	13,642	41,580	24,285	58.40
2009	17.63%	243,166	13,864	29,007	24,844	85.65
2010	18.40%	239,996	13,832	30,328	25,126	82.85
2011	19.84%	239,738	13,745	33,819	25,090	74.19
2012	18.37%	239,053	14,117	29,797	25,109	84.27
2013	22.87%	247,432	15,164	41,424	26,445	63.84
2014	22.13%	259,740	16,564	40,916	35,197	86.02
2015	21.94%	263,844	17,567	40,320	36,711	91.05
2016	22.26%	258,787	18,538	39,068	37,228	95.29
2017	22.44%	264,342	20,146	39,172	38,350	97.90

[1] *Includes contributions from other sources (if applicable).*

[2] *Actuarially Required Contribution Rate prior to change in Actuarial Assumptions is 16.19%.*

Table 16
Additional Disclosures – Development of the Fund
(dollars in thousands)

Year Ended June 30	Employer Contributions	Employee Contributions	Supplemental Contributions*	Actuarial Net Investment Return	Administrative Expenses	Benefit Payments	Actuarial Value of Assets EOY
2006	$ 19,815	$ 13,453	$ 4,200	$ 76,317	$ 591	$ 79,567	$ 938,919
2007	19,666	13,438	4,451	124,214	696	84,271	1,015,722
2008	20,775	13,642	3,509	112,804	691	89,810	1,075,951
2009	21,501	13,864	3,343	28,924	605	93,024	1,049,954
2010	21,018	13,832	4,108	9,496	602	96,362	1,001,444
2011	21,013	13,745	4,077	31,391	722	98,230	972,718
2012	21,452	14,117	3,658	3,447	736	102,726	911,930
2013	22,780	15,164	3,665	37,919	751	104,411	886,296
2014	24,532	16,564	10,665	117,499	739	106,845	947,972
2015	25,505	17,567	11,206	107,987	748	109,753	999,736
2016	26,433	18,538	10,795	64,402	749	111,795	1,007,360
2017	27,543	20,146	10,807	87,243	889	113,743	1,038,467

** Includes employer contributions for reemployed annuitants.*

Table 17
Additional Disclosures – Supplementary Information

Valuation Date	July 1, 2017
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percent of Pay, Closed, Assuming Four Percent Payroll Growth
Amortization Period	Closed Period ending June 30, 2042
Asset Valuation Method	5-Year Smoothed Market
Actuarial Assumptions:	
Investment rate of return	8.00%
Projected salary increases	4.00% - 8.90%; age and service based
Cost-of-living adjustments	1% per year through 2040; 2% beginning January 1, 2041; 2.5% beginning January 1, 2051
Plan Membership:	
Active Members	3,550
Retirees and Beneficiaries	3,851
Terminated Vested Members	2,034
Other Non-Vested Terminated Members	2,945
Total	12,380