2017 Actuarial Valuation Report on the Teachers' Retirement System of Louisiana

Actuarial Valuation as of
June 30, 2017
Issued December 2017

LOUISIANA LEGISLATIVE AUDITOR
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2017 ACTUARIAL VALUATION REPORT

TEACHERS' RETIREMENT SYSTEM OF LOUISIANA

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LOUISIANA LEGISLATIVE AUDITOR
DARYL G. PURPERA, CPA, CFE

December 20, 2017

The Honorable John A. Alario, Jr.,
President of the Senate
The Honorable Taylor Barras,
Speaker of the House of Representatives

Dear Senator Alario and Representative Barras:

This report provides the results of an actuarial valuation of the Teachers' Retirement System of Louisiana as of June 30, 2017, as required under R.S. 11:127(C).

The report contains our findings, conclusions, and recommendations. I hope this report will benefit you in your legislative decision-making process.

Sincerely,

Daryl G. Purpera, CPA, CFE
Legislative Auditor

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TRSL 2017 VALUATION

SUMMARY AND CONCLUSIONS

SUMMARY AND CONCLUSIONS

2017 Valuation Report on the Teachers' Retirement System of Louisiana

This valuation has been prepared as of June 30, 2017, based on plan provisions for the Teachers' Retirement System of Louisiana (TRSL) as documented in Title 11 of Louisiana Revised Statutes (R.S.), Sections 701 through 952. The purpose of the valuation, in general, is to:

1. Measure and compare plan assets and liabilities as of June 30, 2017.

2. Determine the actuarially calculated employer contribution requirement for FYE 2018.

3. Determine the sources and amounts of gains and losses between June 30, 2016, and June 30, 2017.

4. Calculate projected employer contribution rates for FYE 2019.

5. Show measures of funding for actuarial obligations of the retirement system.

As the actuary for the Louisiana Legislative Auditor (LLA), I am required by R.S. 11:127(C) to prepare an actuarial valuation for review by Public Retirement Systems' Actuarial Committee (PRSAC). More specifically, R.S. 11:127(C) states:

> *The actuaries for the public retirement systems, plans, and funds and for the legislative auditor shall submit annual actuarial valuations to the committee. The committee shall review and analyze all the assumptions and valuations submitted. The committee shall, with the consent of the majority of members present and voting, approve a single valuation for each public retirement system, plan, or fund. Once consent of the members is obtained, the actuarial valuations in the form of the official valuations adopted by the committee shall be submitted to the House and Senate committees on retirement and the Joint Legislative Committee on the Budget.*

Furthermore, I am required by Actuarial Standards of Practice (ASOPs) to use an assumption set and a set of methods that I can support based on appropriate facts and evidence.

Because we did not prepare the 2016 valuation, we have prepared the June 30, 2017 valuation as if we were doing so for the first time. It is not uncommon under such circumstances for the reviewing actuary to use assumptions and methods that are more compatable with his own perspectives.

As a result, we have revised the following assumptions and methods in preparing the June 30,2017 valuation for TRSL.

1. Mortality Tables,

2. The Investment Return Assumption,

3. Treatment of Administrative Expenses as required by a change in statute,

4. Treatment of Gain-Sharing COLA benefits.

The following sections provide a brief explanation of the new assumptions and rationale. More details concerning the selection of these assumptions can be found in the Appendices.

Mortality Tables

We revised the mortality tables used in this valuation (for the employer contribution for FYE 2019), in order to employ current actuarial methodologies along with currently published mortality tables and mortality improvement scales, while directly reflecting TRSL'S own mortality experience.

The most recent experience study covered the period July 1, 2007 through June 30, 2012 and was dated March 27, 2013. For this actuarial valuation (specifically, for employer contribution rates for FYE 2019), we chose to reflect the actual mortality experience exhibited by the TRSL active and retiree population directly into the mortality tables.

We recognize that experience studies for larger systems are generally performed every five years and the next one for TRSL is not scheduled for publication until the spring of 2018. However, it is generally accepted among retirement system executives and actuaries that if events occur, or if better or new techniques emerge between experience studies that materially affect results, they would be considered for change. Furthermore, ASOP No. 35 states that at each measurement date, the actuary should determine whether the assumptions continue to be reasonable, which includes the requirement to take into account historical and current demographic data that is relevant as of the measurement date. Therefore, for this actuarial valuation, we employed the changes in mortality tables as described in the Appendix B.

A table on page 5 presents the effect of this mortality change (as well as others) on the projected unfunded accrued liability and the employer contribution rate for FYE 2019.

Investment Return, Inflation and Discount Rate

To provide budget information used by participating employers, Louisiana law provides that a valuation for any given June 30 will be used to establish the projected employer contribution rate for the second fiscal year following the valuation date. The employer rate for the fiscal year immediately after the valuation date is referred to as the actuarial contribution requirement. To make these determinations, we must measure the gain or loss associated with the fiscal year ending on the valuation date and the projected gain or loss for the fiscal year immediately following the valuation date. These gain and losses are based on the accrued liability on the June 30 prior to the the valuation date, the accrued liability on the valuation date, and the accrued liability projected for the June 30 after the valuation date.

Three sets of assumtions are needed for the June 30, 2017 valuation: (1) one set for June 30, 2016, (2) a second set for June 30, 2017, and (3) a third set for June 30, 2018. These assumption sets are summarized below in Exhibit 1.

Exhibit 1
Summary of Assumptions and Methods

Assumtion or Method	June 30, 2016	June 30, 2017	June 30, 2018
Rate of Investment Return	8.10%	8.20%	6.75%
Rate of Inflation	2.50%	2.50%	2.25%
Discount Rate	7.75%	7.70%	6.75%
Treatment of Administrative Expenses	Implicit (10 bps)	Implicit (10 bps)	Explicit (0 bps)
Treatment of Gain-Sharing/COLA benefits	Implicit (25 bps)	Implicit (40 bps)	Explicit (0 bps)
Mortality	Second Most Recent Tablle and Methods	Second Most Recent Tablle and Methods	Most Recent Table and Methods

Based on our research, among many independent national experts in forecasting inflation and investment returns, we have selected an appropriate and mainstream assumption for the net investment return on TRSL'S portfolio of 6.75% (without any further reductions for administrative expenses and Experience Account transfers). For more details on how the 6.75% was determined, refer to Appendix C.

As part of the building block approach to developing the 6.75% stated above, we assumed a mainstream inflation rate of 2.25%. This reduction (from 2.50%) in the assumed rate of inflation is also used to lower the assumed salary scale. Again, for more details on how the 2.25% was determined, refer to Appendix C.

In the interest of transparency, we treat the discount rate as equal to the net investment return assumption in our actuarial valuation for determining the employer contribution requirement for FYE 2019. No further reductions to the 6.75% are made for administrative expenses or for Experience Account transfers. The costs of such plan outflows are more transparently recognized in an explicit manner, as illustrated in Exhibit 1 above.

In short, a consensus of eight major national investment forecasters expects TRSL's investment portfolio to earn substantially less over the mid-term horizon. Therefore, the costs and liabilities to the taxpayers are being measured higher in this valuation. Exhibit 2 on page 5 presents the effect of this net investment return change (as well as others) on the projected unfunded accrued liability and the employer contribution rate for FYE 2019.

Treatment of Administrative Expenses

Act 94 of 2016 requires that the expected noninvestment-related administrative expenses for the contribution year be included in the actuarially required employer contribution beginning with the first fiscal year in which the projected aggregate employer contribution rate, calculated without regard to any changes in the board-approved actuarial valuation rate, will not increase. That threshold was satisfied for the contribution year ending June 30, 2019.

In this actuarial valuation, we applied this direct explicit method to the determination of the contribution rate for the year ending June 30, 2019. We used a load on the normal cost of 0.45% of pay to fund for administrative expenses. For more information on this change in

assumption/method, refer to Appendix D. Exhibit 2 on page 5 presents the effect of the change in treatment of administrative expenses (as well as others) on the projected unfunded accrued liability and the employer contribution rate for FYE 2019.

Treatment of Gain-Sharing COLA Benefits

In this actuarial valuation, we adopted an explicit method of recognizing the expected cost of gain-sharing COLA benefits of the plan. This is being accomplished by estimating, through stochastic modeling techniques, what the single equivalent annual COLA increase is, and measuring the single equivalent benefit in the actuarial valuation.

By modeling the statutory template mechanism using the economic assumptions from eight major national investment forecasters (the same basis used to develop the 6.75% net return assumption for valuation purposes), we determined that a 0.5% annual COLA benefit approximates the future Experience Account transfers over the next 30 years. In other words, an annual COLA grant of 0.5% has a present value that is equal to the present value of the average COLA benefits to be granted in accordance with the current law.

Therefore, the final determination of employer contribution requirements for FYE 2019 presented herein was developed using an annual net return assumption (and discount rate) of 6.75% and a single equivalent COLA increase of 0.5% per year.

For more details on how the 0.5% was determined and the advantages of this explicit approach, refer to Appendix E. Exhibit 2 on page 5 presents the effect of this change in the treatment gain-sharing COLA benefits (as well as others) on the projected unfunded accrued liability and the employer contribution rate for FYE 2019.

The Effect of New Assumptions and Methods

The following table presents employer contribution requirements for FYE 2019 and the unfunded accrued liability associated with each of the four new assumptions/methods described above as projected to July 30, 2018. The entries below isolate the effect of each new assumption/method individually and cumulatively. The cumulative entries in the last column present the total net effect of all new assumptions/methods.

Exhibit 2
The Effect of Changes in Assumptions and Methods on Employer Contribution Rates

The Effects of Changes in Assumptions and Methods	Unfunded Accrued Liability Projected to 6/30/2018 ($ Millions)	Employer Contribution Rate Projected for FYE 2019 (as a % of Projected Covered Pay)
(1) Without Any Changes in Assumptions or Methods *(benchmark values)*	$ 10,617.1	25.8%
(2) Change in Mortality Table *(effect of change in Mortality table against benchmark)*	$ 11,831.1	28.5%
a. Effect of the Change: (2)-(1)	$ 1,214.0	2.7%
(3) New Investment Return Assumption *(effect of changes to the Mortality Table and Investment Rate Assumption against benchmark)*	$ 16,602.5	38.5%
a. Effect of this Additional Change: (3)-(2)	$ 4,771.4	10.0%
(4) New Treatment of Administrative Expense *(effect of changes to the Mortality Table, Investment Rate Assumption, and New Treatment of Administrative Expenses against benchmark)*	$ 16,257.3	37.7%
a. Effect of this Additional Change: (4)-(3)	$ (345.2)	-0.8%
(5) New Treatment of Gain-sharing COLA Benefits *(effect of changes to the Mortality Table, Investment Rate Assumption, and Treatment of Gain-sharing COLA against benchmark)*	$ 15,949.0	36.9%
a. Effect of this Additional Change: (5)-(4)	$ (308.3)	-0.8%
b. Effect of All four Changes: 2a+3a+4a+5a = (5)-(1)	$ 5,331.9	11.1%

Source: Developed by LLA's actuarial staff

(1) Benchmark values have been developed using assumptions employed in determination of the 6/30/2017 Unfunded Accrued Liabilities and 2017/2018 Employer Contribution rate without regard to assumption and method changes scheduled to to be adopted for the next year.

(2) Change in mortality tables from RP-2000 with *static* mortality improvement projection to 2025 per Scale AA to applying TRSL-derived experience factors to RP-2014 with *generational* mortality improvement per Scale MP-2016

(3) Change in net investment return assumption from TRSL's 8.20% (translating to TRSL's 7.70% discount rate) to LLA's 6.75% net investment return assumption

(4) Change in treatment of administrative expenses from TRSL's implicit reduction of net return assumption (down by 0.10%) to LLA's explicit normal cost load (of 0.45% of covered payroll), consistent with Act 94 of 2016 providing for direct funding of non-investment-related administrative expenses through the employer contribution.

(5) Change in gain-sharing COLA increases from TRSL's implicit reduction of net return assumption (down by 0.40%) to LLA's explicit single equivalent annual 0.50% COLA

The above table illustrates effects of implementing assumptions described on the previous pages.

Alternative Funding Policies

If the LLA's actuarial valuation were to be adopted by PRSAC, it would constitute a significant increase in contribution requirements on participating entities all in one year. We recommend that PRSAC consider alternative methods of grading into these requirements over a reasonably short period of time.

The LLA's actuary and staff would be pleased to discuss such alternative methods – smoothing inputs or smoothing outputs. These are reasonable approaches to satisfying two worthy but competing objectives: (a) adoption of mainstream assumptions and (b) short term affordability.

Public Document

This valuation report is a public document. This report has been prepared for the following persons:

Exhibit 3
Summary of Users of the Valuation Report

Potential Users	Definitions	Identified Persons
Principal	A client or employer of the actuary.	1. The Legislative Auditor.
Intended Users	Any person the actuary identifies as able to rely on the actuarial findings of the report.	1. The Louisiana Legislature. 2. PRSAC. 3. TRSL.
Other Users	Any recipient of the report who is not an intended user.	1. Other interested government entities or employees. 2. The public.

Source: Developed by LLA's actuarial staff.

A brief summary of information developed in this valuation and in prior year valuations is presented on the following page.

			----------Prior Years----------	
		June 30, 2017	**June 30, 2016**	**June 30, 2015**
A.	**Membership Data**			
	(1) Retirees	77,258	75,828	75,259
	(2) Actives	84,228	84,068	83,602
	(3) DROP	2,478	2,504	2,283
	(4) Terminated Vested	6,941	6,687	6,606
B.	**Annual Benefits**	$ 1,939,661,208	$ 1,887,454,080	$ 1,820,201,496
C.	**Total Payroll**	3,901,627,792	3,869,730,024	3,815,649,662
D.	**Valuation Assets**	19,210,425,005	18,254,321,142	17,457,243,695
E.	**Experience Account**	37,154,395	24,977,477	226,356,559
F.	**Investment Returns**			
	(1) Market (Total Assets)	15.19%	1.02%	2.52%
	(2) Market (excl. ORP & self-directed)	15.55%	1.04%	2.58%
	(3) Net Actuarial Value	9.15%	6.67%	11.26%
	(4) Rate for DROP Accounts	8.65%	6.17%	10.76%
G.	**Normal Costs**			
	(1) Total in Dollars	$ 473,025,011	$ 466,591,480	$ 463,783,246
	(2) Total Normal Cost Rate	12.12%	12.06%	12.15%
	(3) Employer Normal Cost Rate	4.14%	4.07%	4.17%
H.	**Accrued Liability**	$ 29,762,623,913	$ 29,272,401,978	$ 28,646,296,897
I.	**Unfunded Accrued Liability**	$ 10,552,198,908	$ 11,018,080,836	$ 11,189,053,202
J.	**Funded Percentage**	64.5%	62.4%	60.9%
K.	**Funding Requirements for the Fiscal Year Following the Valuation Date**			
	(1) Employees			
	a) Contributions	$ 317,192,784	$ 314,144,962	$ 310,329,613
	b) Rate	7.98%	7.98%	7.98%
	(2) Employers			
	a) Contributions	$ 1,172,121,168	$ 1,137,650,159	$ 1,125,847,380
	b) Rate	26.40%	25.80%	25.80%
L.	**Funding Requirements for the Subsequent Fiscal Year**			
	(1) Employees			
	a) Contributions	$ 327,430,671	$ 323,541,841	$ 320,647,506
	b) Rate	7.98%	7.98%	7.98%
	(2) Employers			
	a) Contributions	$ 1,697,148,940	$ 1,659,100,736	$ 1,229,229,363
	b) Rate	37.30%	36.70%	27.40%

Contribution Rates for FYE 2019

Employer contribution requirements for FYE 2019 for TRSL vary from sub-plan to sub-plan. Per Act 95 of the 2016 regular session of the legislature, two contribution rates are being developed:

1. The K-12 sub-plan, applicable to teachers employed by school districts, as well as employees classified as Lunch Plan A and Lunch Plan B.

2. The Higher Education sub-plan.

Contribution rates for the sub-plans have one or more of the following component parts:

1. Total normal cost
2. Employee normal cost
3. Employer normal cost
4. Administrative expenses
5. UAL costs that are shared by both sub-plans

Contribution rates are summarized below. More details are presented in Appendix A.

Exhibit 4

Projected Contribution Rates for FYE 2019							
Membership Group	Status 7/1/2017	Total NC % (A)	Employee NC % (B)	Employer NC % (C) = (A) - (B)	Administrative Expense % (D)	Shared UAL % (E)	Total Employer Cost % (F) = (C) + (D) + (E)
Aggregated K–12 (Regular Teachers, Lunch A & B)	O/C*	16.0513	7.9805	8.0708	0.45	29.1251	37.6459
Higher Education	O	14.0063	8.0000	6.0063	0.45	29.1251	35.5814
Total		15.7447	7.9834	7.7613	0.45	29.1251	37.3365

Status
O - Plan open to new members.
C - Plan closed to new members.
* Note: Lunch A sub plan has been closed to new members. New employees of K-12 agencies are eligible for participation in Lunch B or Regular Teachers sub plans.

Source: Developed by LLA's actuarial staff.

Sources and Amounts of Gains and Losses for FYE 2017

Gains and losses during FYE 2017 have been identified below, and the unfunded accrued liability at the end of the year has been reconciled with the unfunded accrued liability on June 30, 2016.

A.	**Unfunded Accrued Liability on June 30, 2016**		**$ 11,018,080,836**
B.	**Increases in the UAL Due to:**		
	1. Interest on the UAL	$ 853,901,265	
	2. Experience Account Allocation	9,891,500	
	3. Permanent Benefit Increase	0	
	4. Employer Contribution Shortfall	0	
	5. Assumption Change	135,132,845	
	6. Investment Loss	0	
	7. Experience Loss	0	
	8. Total Increases = B1 + B2 + B3 + B4 + B5 + B6 + B7		**$ 998,925,610**
C.	**Decreases in the UAL Due to:**		
	1. Employer Amortization Payment	$ 1,014,454,613	
	2. Disbursement from the Experience Account	0	
	3. Employer Contribution Surplus	15,672,044	
	4. Investment Gain	237,471,809	
	5. Experience Gain	197,209,072	
	6. Total Decreases = C1 + C2 + C3 + C4 + C5		**$ 1,464,807,538**
D.	**Unfunded Accrued Liability on June 30, 2017** = A + B8 - C6		**$ 10,552,198,908**

Actuarial Certification

This report is considered to be a Statement of Actuarial Opinion. Therefore, I make the following certification:

I, Paul T. Richmond, am the Manager of Actuarial Services for the Louisiana Legislative Auditor. I am a member of the American Academy of Actuaries, an Associate in the Society of Actuaries, an Enrolled Actuary, and I meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinion contained herein.

Paul T. Richmond

Paul T. Richmond

12/20/17

Date

SECTION I
DEVELOPMENT OF EMPLOYER CONTRIBUTIONS

1. Employer Contribution Requirements for FYE 2018 - Combined Plan

Employer contribution requirements for FYE 2018, as measured for all sub-plans combined using assumptions and methods applicable to that fiscal year, are calculated below. These values have been determined as if the entire system had been measured as a single financial entity. Although R.S. 11:102(D) requires separate calculations of normal cost for two groups of sub-plans within TRSL (i.e., Regular Teachers combined with Lunch Plans A & B, and Higher Education), values in the aggregate are useful for comparisons with contribution requirements for prior years. The amounts shown below for FYE 2018 are based on an 8.20% expected rate of return on investments and a 7.70% discount rate.

		Dollar Amount	Percent of Salary
A.	**Employer Portion of Normal Cost**	$ 164,502,890	4.140369%
B.	**Shared Amortization Payments**	1,004,883,453	22.208658%
C.	**Contribution Variance Payments**	2,734,825	0.060442%
D.	**Total Contribution = A + B + C**	1,172,121,168	26.409469%
E.	**Projected Payroll for FYE 2018**		
	1. Projected Payroll for Normal Costs	3,973,145,635	
	2. Projected Payroll for Amortization Costs	4,524,719,505	
F.	**Total Contribution Rate for FYE 2018**		
	1. Employer Normal Cost Rate = A / E1	4.14%	
	2. Employer Amortization Cost Rate = (B + C) / E2	22.27%	
	3. Total Employer Contribution Rate = F1 + F2	26.4%	
G.	**Minimum Contribution Rate**	15.5%	
H.	**Minimum Required Contribution for FYE 2018 = A + B + E2 x (15.5% - F1)**	678,511,026	15.500000%
I.	**Required Employer Contribution for FYE 2018 = The Greater of D and H**	1,172,121,168	26.409469%

2. Employer Contribution Requirements for FYE 2019 - Combined Plan

Employer contribution requirements for FYE 2019, as measured for all sub-plans combined using assumptions and methods applicable to that fiscal year, are calculated below. These values have been determined as if the entire system had been measured as a single financial entity. Although R.S. 11:102(D) requires separate calculations of normal cost for two groups of sub-plans within TRSL (i.e., Regular Teachers combined with Lunch A & B, and Higher Education), values in the aggregate are useful for comparisons with contribution requirements for prior years. Contribution requirements by sub plan are presented in Appendix A. The amounts shown below for FYE 2019 are based on a 6.75% expected rate of return on investments and a 6.75% discount rate.

		Dollar Amount	Percent of Salary
A.	**Employer Portion of Normal Cost**	$ 318,321,454	7.761316%
B.	**Administrative Expenses**	18,456,233	0.450000%
C.	**Shared Amortization Payments**	1,382,933,771	29.608195%
D.	**Contribution Variance Payments**	80,531	0.001724%
E.	**Total Contribution = A + B + C + D**	1,719,791,989	37.821235%
F.	**Projected Payroll for FYE 2019**		
	1. Projected Payroll for Normal Costs	4,101,385,050	
	2. Projected Payroll for Administrative Expenses	4,101,385,050	
	3. Projected Payroll for Amortization Costs	4,670,780,336	
G.	**Total Contribution Rate for FYE 2019**		
	1. Employer Normal Cost Rate = A / F1	7.76%	
	2. Administrative Expense Rate = B / F2	0.45%	
	3. Employer Amortization Cost Rate = (C + D) / F3	29.61%	
	4. Total Employer Contribution Rate = G1 + G2 + G3	37.8%	
H.	**Minimum Contribution Rate**	15.5%	
I.	**Minimum Required Contribution for FYE 2019 = A + B + F3 x (15.5% - G1 - G2)**	677,277,573	15.500000%
J.	**Required Employer Contribution for FYE 2019 = The Greater of E and I**	1,719,791,989	37.821235%

3. Normal Cost Values - Combined Plan

A. Employer and Employee Normal Costs

Funding rules under R.S. 11:21 require normal costs to be determined in accordance with the Entry Age Normal (EAN) funding method. Employee contributions and actuarially calculated employer normal cost values for FYE 2018 are based on the valuation of normal costs as of June 30, 2017. The total normal cost percentage is calculated as the total normal cost for FYE 2018 divided by the payroll as of June 30, 2017. The employee normal cost is calculated as employee contributions collected in FYE 2017 divided by the June 30, 2017 payroll. The employer normal cost percentage is equal to the difference between the total normal cost percentage and the employee normal cost percentage. These percentages are then multiplied by the projected payroll for FYE 2018 to determine dollar contribution amounts for that fiscal year.

Projected normal costs for FYE 2019 are calculated in a similar manner. The calculated normal cost percentages, however, are multiplied by projected payroll amounts for FYE 2019.

Normal costs and projected payroll values for FYE 2018 and 2019 are based on 7.70% and 6.75% discount rates, respectively. The basis for these rates is described in Section II of this report (please refer to Appendix C – Basis For Economic Assumptions for further details). Other assumption changes are also identified in the Appendices.

Development of Employer Contributions

		June 30, 2017 Valuation		June 30, 2016 Valuation	
		Actuarial FYE 2018	Projected FYE 2019	Actuarial FYE 2017	Projected FYE 2018
A.	**Discount Rate**	7.70%	6.75%	7.75%	7.70%
B.	**Total Normal Cost**				
	1. Retirement Benefits	$ 305,135,968	$ 408,206,758	$ 304,492,745	$ 307,886,370
	2. Disability Benefits	14,558,297	18,855,288	14,365,660	14,470,120
	3. Survivor Benefits	11,324,442	8,766,329	10,964,092	11,047,435
	4. Voluntary Benefits	142,006,304	178,472,494	136,768,983	137,985,250
	5. Load for Administrative Expenses	N/A	17,557,325	N/A	N/A
	6. Total Normal Cost	$ 473,025,011	$ 631,858,194	$ 466,591,480	$ 471,389,175
C.	**Payrolls**				
	1. On Valuation Date	$ 3,901,627,792	$ 3,901,627,792	$ 3,869,730,024	$ 3,869,730,024
	2. Projected for FY after Valuation Date	3,973,145,635	n/a	3,935,352,728	n/a
	3. Projected for 2nd FY after Valuation Date	n/a	4,101,385,050	n/a	4,053,069,190
	4. ORP – Salary Adjustment Factor	1.13883	1.13883	1.142943333	1.142943333
D.	**Normal Cost Rates**				
	1. Total Normal Cost Rate = B6 / C1	12.123786%	16.194733%	12.057469%	12.181449%
	2. Employee Normal Cost Rate	7.983417%	7.983417%	7.982638%	7.982638%
	3. Employer Normal Cost Rate = D1 - D2	4.140369%	8.211316%	4.074831%	4.198811%
E.	**Employer Normal Cost**				
	1. For 1st FY after Valuation Date = C2 x D3	$ 164,502,890	n/a	$ 160,358,973	n/a
	2. For 2nd FY after Valuation Date = C3 x D3	n/a	$ 336,777,687	n/a	$ 170,180,715
F.	**Employee Normal Cost**				
	1. For 1st FY after Valuation Date = C2 x D2	$ 317,192,784	n/a	$ 314,144,962	n/a
	2. For 2nd FY after Valuation Date = C3 x D2	n/a	$ 327,430,672	n/a	$ 323,541,842
G.	**Total Normal Cost**				
	1. For FYE 2018 = E1 + F1	$ 481,695,674	n/a	$ 474,503,935	n/a
	2. For FYE 2019 = E2 + F2	n/a	$ 664,208,359	n/a	$ 493,722,557

B. Increases in Normal Costs Attributable to Assumption and Method Changes

The following assumptions will be changed effective June 30, 2018:

1. Mortality Tables,
2. Investment Return, Inflation and the Discount Rate assumptions,
3. Treatment of Administrative Expenses, and
4. Treatment of Gain-sharing COLA benefits.

In particular, the discount rate will be changed from 7.70% to 6.75% on June 30, 2018. Please refer to the Appendices for further details pertaining to the assumption changes.

The table below shows the effect of a change in assumptions and methods on normal cost values. If aassumptions and methods had been changed effective June 30, 2017, then employer normal cost rates for FYE 2018 would change.

1. The total normal cost rate for FYE 2018 would increase from 12.123786% to 16.194733%, and increase of 4.070947 percentage points.

2. The employer normal cost would increase from 4.140360% to 8.211316%, also an increase of 4.070947 percentage points.

3. The employee normal cost rate would not change at all.

If this change occurs effective June 30, 2017, the employer normal cost for FYE 2018 would increase from $164,502,890 to $326,247,543, an increase of $161,744,653. The projected increase for FYE 2019 would be $166,965,212.

If the changes in assumptions and methods occur effective June 30, 2018, the employer normal cost for FYE 2018 will not change. However, the projected employer normal cost rate for 2019 will increase. For the purposes of this analysis, we have assumed that projected employer normal cost rates will not be affected by the date of the change; whether the change occurs on June 30, 2017 or June 30, 2018.

Development of Employer Contributions

		For the June 30, 2017 Valuation		Increase/
		Old Assumptions	New Assumptions	(Decrease)
A.	**Discount Rate**	7.70%	6.75%	
B.	**Total Normal Cost**			
	1. Retirement Benefits	$ 305,135,968	$ 408,206,758	$ 103,070,790
	2. Disability Benefits	14,558,297	18,855,288	4,296,991
	3. Survivor benefits	11,324,442	8,766,329	(2,558,113)
	4. Voluntary Terminations	142,006,304	178,472,494	36,466,190
	5. Load for Administrative Expenses	N/A	17,557,325	17,557,325
	6. Total Normal Cost	$ 473,025,011	$ 631,858,194	$ 158,833,183
C.	**Payrolls**			
	1. Projected Payroll on June 30, 2017	3,901,627,792	3,901,627,792	0
	2. Projected Payroll for FYE 2018	3,973,145,635	3,973,145,635	0
	3. Projected Payroll for FYE 2019	4,101,385,050	4,101,385,050	0
	4. ORP - Salary Adjustment Factor	1.13883	1.13883	
D.	**Normal Cost Rates**			
	1. Total Normal Cost Rate	12.123786%	16.194733%	4.070947%
	2. Employee Normal Cost Rate	7.983417%	7.983417%	0.000000%
	3. Employer Normal Cost Rate = D1 - D2	4.140369%	8.211316%	4.070947%
E.	**Employer Normal Costs**			
	1. Projected Cost for FYE 2018 = C2 x D3	164,502,890	326,247,543	161,744,653
	2. Projected Cost for FYE 2019 = C3 x D3	169,812,475	336,777,687	166,965,212

4. Unfunded Accrued Liability

A. Unfunded Accrued Liability as of June 30, 2017

Funding rules under R.S. 11:21 require a measurement of the unfunded accrued liability for the plan to be calculated in accordance with the Entry Age Normal funding method. This measurement is to be made for all sub-plans combined. Accrued liability values as of June 30, 2017, are based on a 7.70% discount rate net of investment expenses, and other assumptions and methods applicable to FYE 2018 as described in Section IV of this report. The unfunded accrued liability is based on the actuarial value of assets measured on June 30, 2017.

The components of the unfunded accrued liability on June 30, 2017, and June 30, 2016, are shown below.

		Valuation Date	
		June 30, 2017	**June 30, 2016**
A.	**Discount Rate**	7.70%	7.75%
B.	**Accrued Liability**		
	1. Accrued Liability for Active Members		
	(a) Retirement Benefits	$ 7,725,929,420	$ 7,703,033,944
	(b) Disability Benefits	146,890,693	144,592,915
	(c) Survivor Benefits	137,955,169	135,025,810
	(d) Voluntary Terminations	313,899,689	272,396,531
	(e) Total	$ 8,324,674,971	$ 8,255,049,200
	(f) Ratio of Active Liability to Total Accrued Liability	27.97%	28.20%
	2. Accrued Liability for Retired and Inactive Members		
	(a) Regular Retirees	$ 16,459,826,669	$ 16,101,366,471
	(b) Disability Retirees	455,327,086	445,123,589
	(c) Survivors	1,105,159,843	1,057,732,944
	(d) Members with a Deferred Benefit	327,107,035	306,722,016
	(e) Contributions to be Refunded	135,466,985	131,749,421
	(f) Deferred Benefits for DROP Members	1,855,657,127	1,873,371,007
	(g) Account Balances for DROP Members	1,099,404,197	1,101,287,330
	(h) Total	$ 21,437,948,942	$ 21,017,352,778
	(i) Ratio of Inactive Liability to Total Accrued Liability	72.03%	71.80%
	3. Total Accrued Liability	$ 29,762,623,913	$ 29,272,401,978
C.	**Valuation Assets**	$ 19,210,425,005	$ 18,254,321,142
D.	**Unfunded Accrued Liability**	$ 10,552,198,908	$ 11,018,080,836
E.	**Funded Ratio = C / B3**	64.5%	62.4%

B. Reconciliation of UAL between June 30, 2016 and June 30 2017

The unfunded accrued liability on June 30, 2017, is reconciled below with the unfunded accrued liability on June 30, 2016.

A.	**Unfunded Accrued Liability on June 30, 2016**		**$ 11,018,080,836**
B.	**Increases in the UAL Due to:**		
	1. Interest on the UAL	$ 853,901,265	
	2. Experience Account Allocation	9,891,500	
	3. Permanent Benefit Increase	0	
	4. Employer Contribution Shortfall	0	
	5. Assumption Change	135,132,845	
	6. Investment Loss	0	
	7. Experience Loss	0	
	8. Total Increases = B1 + B2 + B3 + B4 + B5 + B6 + B7		**998,925,610**
C.	**Decreases in the UAL Due to:**		
	1. Employer Amortization Payment	$ 1,014,454,613	
	2. Legislative Allocation	0	
	3. Employer Contribution Surplus	15,672,044	
	4. Investment Gain	237,471,809	
	5. Experience Gain	197,209,072	
	6. Total Decreases = C1 + C2 + C3 + C4 + C5		**1,464,807,538**
D.	**Unfunded Accrued Liability on June 30, 2017**		
	= A + B8 - C6		**$ 10,552,198,908**

C. Projected Increases in Accrued Liabilities on June 30, 2018 Attributable to Assumption and Method Changes.

The following assumptions and methods will be changed effective June 30, 2018.

1. The mortality table will be changed to reflect more recent mortality experience nationwide.

2. The Investment Return Assumption will be changed from 8.20% to 6.75%. The discount rate will be changed from 7.70% to 6.75%.

3. Methods used to account for administrative expenses will be changed from an implicit methodology to an explicit process.

4. Methods used to account for Gain-sharing COLA benefits will be changed from an implicit methodology to an explicit process.

Liability values before and after these changes on June 30, 2017, have been calculated and projected to June 30, 2018. For this comparison, we have assumed that June 30, 2018, values with and without the assumption and method changes will be the same as June 30, 2017, values with and without assumption and method changes. Projected values as of June 30, 2018, are compared below.

		Projected Accrued Liability on June 30, 2018		
		Old Assumptions 7.70% Discount Rate	New Assumptions 6.75% Discount Rate	Increase/ (Decrease)
A.	Accrued Liability for Active Members	$ 8,324,674,971	$ 10,274,453,832	$ 1,949,778,861
B.	Accrued Liability for Retired and Inactive	21,437,948,942	24,863,704,221	3,425,755,279
C.	Accrued Liability on June 30, 2018 = A + B	29,762,623,913	35,138,158,053	5,375,534,140
D.	Interest Adjustment	2,291,722,041	2,371,825,669	80,103,628
E.	Normal Cost	481,695,674	643,440,318	161,744,644
F.	Interest Adjustment for One Half Year	18,201,403	21,361,521	3,160,118
G.	Estimated Benefit Payments	2,176,062,329	2,176,945,718	883,389
H.	Interest Adjustment for One-Half Year	82,224,920	72,272,238	(9,952,682)
I.	Projected Accrued Liability on June 30, 2018 = C + D + E + F - G - H	**$ 30,295,955,782**	**$ 35,925,567,605**	**$ 5,629,611,823**

D. Projected Unfunded Accrued Liability on June 30, 2018

The calculation of the projected unfunded accrued liability as of June 30, 2018, is shown below.

A.	**Unfunded Accrued Liability on June 30, 2017**		$ 10,552,198,908
B.	**Increases in the UAL Due to:**		
	1. Interest on the UAL	$ 812,519,316	
	2. Expected Employer Contribution Shortfall	343,449	
	3. Recognition of Gain Sharing	0	
	4. Assumption Changes	5,629,611,823	
	5. Total Increases = B1 + B2 + B3 + B4		$ 6,442,474,588
C.	**Decreases in the UAL Due to:**		
	1. Employer Amortization Payment	$ 1,045,692,248	
	2. Employer Contribution Surplus	0	
	3. Total Decreases = C1 + C2		$ 1,045,692,248
D.	**Projected Unfunded Accrued Liability on June 30, 2018** = A + B5 - C3		$ 15,948,981,248

5. Assets

A. Actuarial Value of Assets

The actuarial value of assets is the market value of assets adjusted to phase in realized and unrealized investment gains and losses that occurred over the four-year period immediately prior to the valuation date.

A.	Investment Gain/(Losses) Based on Market	June 30, 2017	June 30, 2016	June 30, 2015	June 30, 2014
	1. BOY Market Value	$ 17,537,950,955	$ 17,896,379,678	$ 17,886,838,190	$ 15,490,236,860
	2. Contributions	1,491,336,625	1,528,698,762	1,581,664,935	1,538,445,595
	3. Legislative Appropriations	0	-	10,384,806	5,578,791
	4. Benefit Payments	2,113,255,290	2,050,287,273	2,008,403,199	1,934,766,027
	5. Administrative Expenses	18,194,370	17,432,419	19,265,221	17,522,895
	6. EOY Market Value	19,513,345,675	17,537,950,955	17,896,379,678	17,900,035,458
	7. Actual Investment Income = A6 - A1 - A2 - A3 + A4 + A5	2,615,507,755	180,592,207	445,160,167	2,818,063,134
	8. Expected Investment Income Based on the Discount Rate	1,334,386,819	1,366,082,362	1,368,947,325	1,222,665,216
	9. Gain/(Loss) = A7 - A8	1,281,120,936	(1,185,490,155)	(923,787,158)	1,595,397,918

B.	Market Value Adjustment	Gain/(Loss) (a)	Factor (b)	Market Value Adjustment (c) = (a) x (b)
	1. Adjustment for 2017	$ 1,281,120,936	80%	$ 1,024,896,749
	2. Adjustment for 2016	(1,185,490,157)	60%	(711,294,094)
	3. Adjustment for 2015	(923,787,158)	40%	(369,514,863)
	4. Adjustment for 2014	1,595,397,918	20%	319,079,584
	5. Total Market Value Adjustment			263,167,376

C.	**Preliminary Actuarial Value**	
	1. Market Value on June 30, 2017 = A6	19,513,345,675
	2. Market Value Adjustment = B5	263,167,376
	3. Preliminary Actuarial Value = C1 - C2	19,250,178,299
D.	Corridor Values	
	1. 80% x Market Value	15,610,676,540
	2. 120% x Market Value	23,416,014,810
E.	Actuarial Value of Assets = Preliminary Value if Preliminary Value is inside the Corridor. Otherwise the Actuarial Value = the average between the Preliminary Value and the Corridor	$ 19,250,178,299

B. Investment Gain/(Loss)

The investment gain/(loss) is measured as the difference between actuarial and expected investment earnings during FYE 2017.

A.	**Components of the Gain/(Loss) Calculation**	
	1. Net Actuarial Value of Assets on June 30, 2016	$ 17,865,227,006
	2. Contributions for FYE 2017	1,397,585,641
	3. Legislative Appropriations	0
	4. Benefits Paid for FYE 2017	2,021,134,252
	5. Administrative Expenses Paid for FYE 2017	18,194,370
	6. Net Actuarial Value of Assets on June 30, 2017	18,828,777,469
	7. Expected Rate of Return on Assets	7.75%
B.	Actual Investment Earnings = A6 - A1 - A2 - A3 + A4 + A5	$ 1,605,293,444
C.	Expected Investment Earnings	1,360,151,549
D.	Investment Gain/(Loss) = B - C	$ 245,141,895

C. Allocation of Investment Gains to DROP, LSU Extension Service and the Experience Account

According to R.S. 11:883.1, 50% of the total investment gain, not associated with DROP accounts, in excess of $200 million will be transferred from the regular asset pool to the Experience Account. Beginning June 30, 2016, the $200 million hurdle will be indexed by the increase in the actuarial value of assets, if any. Moreover, the transfer to the Experience Account is capped by the maximum COLA if the retirement system is less than 80% funded and two COLAs otherwise.

Funded Ratio	Maximum COLA
< 55%	0%
55% to < 65%	1.5%
65% to < 75%	2.0%
75% to < 80%	2.5%
80% +	3.0%

The amount of assets to be transferred under R.S. 11:883.1 from the regular pool of assets to the Experience Account is calculated below.

Development of Employer Contributions

A.	**Excess Investment Earnings = Gross Investment Gain**	245,141,895
B.	**Excess Investment Earnings Paid to DROP Accounts**	
	1. DROP Accounts Eligible for System Investment Earnings	
	a. Total of all DROP and IBO accounts	$ 1,054,462,712
	b. DROP accounts for Actives not entitled to system earnings	113,507,147
	c. Self-directed DROP accounts not entitled to system earnings	421,400,830
	d. DROP accounts entitled to system earnings = B1a - B1b - B1c	519,554,735
	2. Rate of Return Attributable to Excess Earnings on DROP Accounts	
	a. Actual rate of return on investments for DROP accounts	8.650000%
	b. Expected rate of return for DROP accounts*	7.250000%
	c. Rate of return attributable to excess earnings = B2a - B2b	1.400000%
	3. Excess Investment Earnings Paid to DROP Accounts = B1d x B2c	7,273,766
C.	**Investment Gain/(Loss) Paid to LSU Ext Service Account**	
	1. LSU Ag Ext Service Account at Beginning of the Year	2,535,804
	2. Contributions to the LSU Ag Ext Service at the Beginning of the Year	1,754,855
	3. Benefit Payments from the LSU Ag Ext Service Account at Mid-Year	1,995,075
	4. Actual Rate of Return on Investments for LSU Ag Ext Service Accounts	9.210562%
	5. Expected Rate of Return for LSU Ag Ext Service Accounts	7.75%
	6. Actual Investment Earnings on LSU Ag Ext Service Account	303,315
	7. Expected Investment Earnings on LSU Ag Ext Service Account	256,659
	8. Excess Investment Earnings Paid to LSU Ag Ext Service Account = C6 - C7, not less than 0	46,656
D.	**Benefit Disbursements**	0
E.	**Investment Gain/(Loss) Paid to the Experience Account**	
	1. Experience Account Assets Entitled to System Earnings	24,977,477
	2. Actual Rate of Return on the Actuarial Value of Assets	9.149914%
	3. Actual Investment Earnings on EA Assets Entitled to System Earnings = E1 x E2	2,285,418
	4. Expected Rate of Return on the Actuarial Value of Assets	7.750000%
	5. Expected Investment Earnings on EA Assets = E1 x E4	1,935,754
	6. Potential Investment Gains for the Experience Account = E3 - E5	349,664
	7. Maximum Fund in the Experience Account = Present Value of a 1.5% PBI	223,442,355
	8. Maximum Investment Earnings that Can Be Allocated to the EA = E7 - (E1 - D)	198,464,878
	9. Investment Earnings Potentially Allocated to the EA = lesser of E3, E5 and E8	1,935,754
	10. Investment Gains for the Experience Account = lesser of E6 and (E8 - E9)	349,664
	11. Allocation of Investment Earnings to the Experience Account = E9 + E10	2,285,418
	12. Investment Earnings to be Treated as Investment Gains = E3 - E11, not less than 0	0
F.	**Miscellaneous Items**	0

G.	**Net Excess Investment Earnings = A - B3 - C8 + E10 - E12 - F, not less than 0**	237,471,809
H.	**Allocation of Excess Investment Earnings to the Experience Account**	
	1. Net Excess Investment Earnings = G	237,471,809
	2. Administrative Expense	0
	3. Threshold Gain	217,688,810
	4. Gain Available for Gain Sharing = H1 - H2 - H3, not less than 0	19,782,999
	5. Gain Sharing Percentage	50%
	6. Preliminary Allocation of Excess Gains to the Experience Account = H4 × H5	9,891,500
	7. Maximum Excess Investment Earnings that Can be Applied to EA = E8	198,464,878
	8. Allocation of Excess Gains to the Experience Account = lesser H6 and H7	9,891,500

* Determined as: [Discount Rate - 50 Basis Points] = [7.75% - 0.5%] = 7.25%

F. Employer Shortfall/(Surplus)

Employer Contribution Shortfall/(Surplus) for FYE 2017

Total contributions received from participating employers were higher in FYE 2017 than were expected. As a result, asset values are more than what they would have been otherwise. The unfunded accrued liability has decreased because of the contribution surplus. The surplus will be used to reduce the Experience Account Amortization Base (EAAB), without a recalculation of amortization payments. The calculation of the surplus as of June 30, 2017 is shown below.

A.	**Actual Employer Contributions**	
	1. Employer Contributions	$ 1,037,915,514
	2. Employer Amortization Payments for ORP Members	122,560,251
	3. Other Appropriations	28,103
	4. Actual Employer Contributions = A1 + A2 + A3	$ 1,160,503,868
B.	**Expected Employer Contributions**	
	1. Employee Contributions for Regular Teachers	$ 328,181,975
	2. Employee Contribution Rate for Regular Teachers	8.00%
	3. Salaries upon which Employer Contributions Received = B1 / B2	4,102,274,688
	4. Employee Contributions for Lunch Plan A Members	35,086
	5. Employee Contribution Rate for Lunch Plan A Members	9.10%
	6. Salaries upon which Employer Contributions Were Received = B4 / B5	385,560
	7. Employee Contributions for Lunch Plan B Members	1,149,429
	8. Employee Contribution Rate for Lunch Plan B Members	5.00%
	9. Salaries upon which Employer Contributions Received = B7 / B8	22,988,580
	10. Total Salaries upon which Contributions Were Received = B3 + B6 + B9	$ 4,125,648,828
	11. Employer Normal Cost Rate for FYE 2017	4.07486853%
	12. Employer Normal Costs = B10 x B11	168,114,766
	13. Contributions to the Employer Credit Account for FYE 2017	0
	14. Amortization Payments for FYE 2017	974,555,726
	15. Payment toward Contribution Variances for FYE 2017	2,735,460
	16. Expected Employer Contributions = B12 + B13 + B14 + B15	1,145,405,952
C.	**Mid-Year Employer Shortfall/(Surplus) for FYE 2017 = B16 - A4**	$ (15,097,916)
D.	**Interest at 7.75% for One-Half Year**	(574,128)
E.	**Employer Shortfall/(Surplus) on June 30, 2017 = C + D**	$ (15,672,044)

D. Projected Employer Contribution Shortfall/(Surplus) for FYE 2018

A shortfall in employer contributions is expected to occur for FYE 2018. No shortfall/(surplus) will occur relative to non-ORP members: actual and projected employer contributions have the same value. No shortfall/(surplus) will occur for ORP member normal costs because these participants do not have a normal cost. The only component of the total employer contribution that may incur a shortfall/(surplus) is the amortization cost for OPR members.

The actual employer contribution rate for amortization costs pertaining to ORP members will be 22.20972344%. This is the rate for FYE 2018 set by PRSAC based on the June 30, 2016 valuation. However, the required employer contribution rate for amortization costs based on the June 30, 2017 valuation is 22.26918767%. Therefore, expected contribution for FYE 2018 (based on the rate set by PRSAC) will be less than the amount necessary to fully offset amortization charges for FYE 2018, and contribution will result.

A.	**Projected Employer Contribution Shortfall/(Surplus) for Regular Non-ORP Members**		
	1. Actual Employer Contributions Required in Mid-Year for FYE 2018	$	1,048,910,448
	2. Projected Employer Contributions Expected in Mid-Year for FYE 2018		1,048,910,448
	3. Shortfall/(Surplus) of Regular Employer Contributions Expected Mid-Year for FYE 2018 = A1 - A2		0
B.	**Projected Employer Contribution Shortfall/(Surplus) for ORP Members**		
	1. Projected Employer Contribution Rate for FYE 2018		22.20972344%
	2. Actual Employer Contribution Rate for FYE 2018		22.26918767%
	3. Contribution Rate Shortfall for FYE 2018 = B2 - B1		0.059464230%
	4. Actual ORP Payroll for FYE 2018	$	551,573,870
	5. Shortfall/(Surplus) of ORP Employer Contributions Expected Mid-Year for FYE 2018 = B3 x B4	$	327,989
C.	**Total Employer Contribution Shortfall/(Surplus) at Mid-Year 2018 = A3 + B5**	$	327,989
D.	**Interest for One-Half Year**	$	12,505
E.	**Total Employer Contribution Shortfall/(Surplus) at FYE 2018**	$	343,449

E. Asset Allocation (Market Values)

		June 30, 2017	June 30, 2016
A.	**Short-Term Assets**		
	1. Cash/Cash Equivalents	$ 216,603,032	$ 5,279,450
	2. Short-Term Investments	1,033,090,820	1,307,428,499
B.	**Bonds**		
	1. Domestic Issues	1,913,773,495	1,828,132,715
	2. International Issues	1,568,601,507	1,413,994,202
C.	**Equities**		
	1. Domestic Stock	5,927,969,405	5,161,381,152
	2. International Stock	3,465,254,946	3,166,197,700
D.	**Other Assets**		
	1. Fixed Assets	3,430,912	3,710,875
	2. Real Estate and Alternative Investments	5,296,424,434	4,573,041,477
E.	**Receivables Minus Payables**	88,197,124	78,784,885
F.	**Other Adjustments**	0	0
G.	**Total Assets**	$ 19,513,345,675	$ 17,537,950,955

F. Income Statement (Market Value)

		FYE June 30, 2017	FYE June 30, 2016
A.	**Income**		
	1. Contribution Income		
	a. Member Contributions	$ 328,541,240	$ 330,773,316
	b. Employer Contributions	1,037,915,514	1,066,521,193
	c. ORP Contributions	122,560,251	128,543,466
	d. Total = A1a + A1b + A1c	1,489,017,005	1,525,837,975
	2. Other Income		
	a. IUAL Appropriations	0	0
	b. Other Appropriations	28,103	34,500
	c. LSU Coop/Ext	1,754,855	1,830,995
	d. Miscellaneous	536,662	995,292
	e. Total = A2a + A2b + A2c + A2d	2,319,620	2,860,787
	3. Net Investment Income		
	a. Investment Income	2,650,391,172	216,567,366
	b. Investment Expense	34,883,417	35,975,157
	c. Net Investment Income = A3a - A3b	2,615,507,755	180,592,209
	Total Income = A1d + A2e + A3c	$ 4,106,844,380	$ 1,709,290,971
B.	**Expense**		
	1. Operating Expense		
	a. General Administration	14,368,886	15,275,760
	b. Post-Employment Benefits	586,166	(24,005)
	c. Depreciation	432,238	407,105
	d. Other Expenses	2,807,080	1,773,559
	e. Total = B1a + B1b + B1c + B1d	18,194,370	17,432,419
	2. Benefit Payments		
	a. Pension Benefits	2,063,449,370	2,001,145,698
	b. Return of Employee Contributions	49,805,920	49,141,575
	c. Total = B2a + B2b	2,113,255,290	2,050,287,273
	3. Total Expense = B1e + B2c	$ 2,131,449,660	$ 2,067,719,692
C.	**Net Income = A4 - B3**	$ 1,975,394,720	$ (358,428,721)

G. Allocation of Assets to Sub-accounts

		FYE June 30, 2017	FYE June 30, 2016
A.	**Employer Credit Account**		
	1. Beginning Balance for Current Year	0	0
	2. Allocation for Current Year	0	0
	3. Disbursements for Current Year	0	0
	4. Accumulated Interest for Current Year	0	0
	5. Ending Balance for Current Year = A1 + A2 - A3 + A4	0	0
B.	**Initial UAL Amortization Fund**		
	1. Beginning Balance for Current Year	0	0
	2. Allocation for Current Year	0	0
	3. Disbursements for Current Year	0	0
	4. Accumulated Interest	0	0
	5. Ending Balance for Current Year = B1 + B2 - B3 + B4	0	0
C.	**Experience Account Fund**		
	1. Beginning Balance for Current Year	$ 24,977,477	$ 226,356,559
	2. Allocation for Current Year	9,891,500	0
	3. Disbursements for Current Year	0	(216,473,124)
	4. Accumulated Interest	2,285,418	15,094,042
	5. Ending Balance for Current Year = C1 + C2 + C3 + C4	$37,154,395	$24,977,477
D.	**LSU Ag/Ext Service**		
	1. Beginning Balance for Current Year	$ 2,535,804	$ 2,360,090
	2. Allocation for Current Year	1,754,855	1,830,995
	3. Disbursements for Current Year	1,995,075	1,873,303
	4. Accumulated Interest	303,315	218,022
	5. Ending Balance for Current Year = D1 + D2 - D3 + D4	$2,598,899	$2,535,804
E.	**Valuation Assets**		
	1. Actuarial Value of Assets	$ 19,250,178,299	$ 18,281,834,423
	2. Employer Credit Account = A5	0	0
	3. Initial UAL Amortization Fund = B5	0	0
	4. Experience Account Fund = C5	37,154,395	24,977,477
	5. LSU Ag/Ext Service = D5	2,598,899	2,535,804
	6. Valuation Assets = E1 - E2 - E3 - E4 - E5	$ 19,210,425,005	$ 18,254,321,142

6. Rates of Return on Investments

A. Rates of Return on Investments Based on Market Value

The market value of assets includes funds that have been invested outside the trust fund by members with money in self-directed and ORP accounts. Column (a) shows the rate of return on investments with these account funds included; column (b) shows the rate of return associated with self-directed and ORP account funds; and column (c) shows the rate of return with these funds excluded.

		Market Value (a)	Self-Directed & ORP Values (b)	Net Market Value (c) = (a) - (b)
A.	Asset Value on June 30, 2016	$ 17,537,950,955	$ 416,607,417	$ 17,121,343,538
B.	Contributions	$ 1,491,336,625	$ 93,750,984	$ 1,397,585,641
C.	Benefit Payments	$ 2,113,255,290	$ 92,121,038	$ 2,021,134,252
D.	Administrative Expenses	18,194,370	0	18,194,370
E.	Asset Value on June 30, 2017	$ 19,513,345,675	$ 421,400,830	$ 19,091,944,845
F.	Investment Income = E - A - B + C + D	$ 2,615,507,755	$ 3,163,467	$ 2,612,344,288
G.	Unrounded Rates of Return	15.190636%	0.757857%	15.549231%
H.	Rounded Rate of Return on Investments	15.19%	0.76%	15.55%

B. Rates of Return on Investments Based on Actuarial Value

The actuarial value of assets includes funds that have been invested outside the trust fund by members with money in ORP and self-directed accounts. Column (a) shows the rate of return on investments with these account funds included; column (b) shows the rate of return associated with ORP and self-directed account funds; and column (c) shows the rate of return with these funds excluded.

		Actuarial Value (a)	Self-Directed & ORP Values (b)	Net Actuarial Value (c) = (a) - (b)
A.	Asset Value on June 30, 2016	$ 18,281,834,423	$ 416,607,417	$ 17,865,227,006
B.	Contributions	1,491,336,625	93,750,984	1,397,585,641
C.	Benefit Payments	2,113,255,290	92,121,038	2,021,134,252
D.	Administrative Expenses	18,194,370	0	18,194,370
E.	Asset Value on June 30, 2017	$ 19,250,178,299	$ 421,400,830	$ 18,828,777,469
F.	Investment Income = E - A - B + C + D	$ 1,608,456,911	$ 3,163,467	$ 1,605,293,444
G.	Unrounded Rates of Return	8.954887%	0.757857%	9.149914%
H.	Rounded Rate of Return on Investments	8.95%	0.76%	9.15%

C. Rate of Return to Be Granted on Drop Accounts

A.	Rounded Rate of Return on the Net Actuarial Value of Assets	9.15%
B.	Reduction for Administrative Expenses	0.50%
C.	Rate of Return to Be Granted on DROP Accounts	8.65%

D. Summary of Rates of Return on Investments

		Rates Measured on June 30				
		2017	**2016**	**2015**	**2014**	**2013**
A.	Total Market Value	15.19%	1.02%	2.52%	18.44%	12.57%
B.	Market Value Net of Self-Directed and ORP Accounts	15.55%	1.04%	2.58%	18.90%	12.79%
C.	Actuarial Value Net of Self-Directed and ORP Accounts	9.15%	6.67%	11.26%	13.14%	13.41%
D.	Five-Year Geometric Average of the Actuarial Value Net of Self-Directed and ORP Accounts	10.70%	9.85%	9.80%	7.30%	1.96%
E.	Interest Credited to Self-Directed and ORP Accounts	0.76%	0.34%	10.76%	12.64%	12.91%

7. Amortization Payments for FYE 2018

Year	Description	Amortization Method	Amortization Period	Initial Liability	Years Remaining	Balance on June 30, 2017	Mid-Year Payment	Balance on June 30, 2018
Shared Bases								
2010	Orig Amort Base	I	19	$ 2,677,501,778	12	$ 2,114,835,670	$ 277,558,112	$ 1,989,632,065
2010	Exp Acct Amort Base	I	30	3,999,115,151	23	3,499,046,178	365,395,967	3,389,269,876
2009	Change in Liability	L	30	2,979,708,647	22	2,700,212,884	249,046,832	2,649,671,934
2010	Change in Liability	L	30	1,150,854,854	23	1,059,900,705	96,087,157	1,041,795,143
2011	Change in Liability	L	30	(175,198,199)	24	(163,743,956)	(14,612,723)	(161,187,360)
2012	Change in Liability	L	30	125,767,665	25	119,132,638	10,479,627	117,430,240
2013	Change in Liability	L	30	(248,560,781)	26	(238,348,366)	(20,692,015)	(235,227,305)
2013	Assumption Change	L	30	871,681,891	26	835,867,800	72,565,168	824,922,498
2013	Asset Valuation Method	L	30	(25,686,598)	26	(24,631,233)	(2,138,340)	(24,308,698)
2014	Liability Gain	L	30	(162,364,783)	27	(157,505,848)	(13,509,486)	(155,613,841)
2014	Assumption Change	L	30	570,933,583	27	553,847,803	47,504,263	547,194,820
2014	Funding Method	L	30	881,187,059	27	854,816,619	73,318,759	844,548,309
2014	Reduction in EA Deposit	L	5	(76,831,515)	2	(34,206,677)	(18,407,633)	(17,737,405)
2014	Gain from $100-$200M	L	5	(100,000,000)	2	(44,521,674)	(23,958,440)	(23,086,107)
2014	Remaining Investment Gain	L	5	(247,166,403)	2	(110,042,619)	(59,217,215)	(57,061,098)
2015	Experience Gain	L	30	(37,106,169)	28	(36,393,823)	(3,087,115)	(35,992,382)
2015	Investment Gain	L	30	(339,621,226)	28	(333,101,332)	(28,255,399)	(329,427,074)
2016	Experience Gain	L	30	(157,650,103)	29	(156,193,307)	(13,114,814)	(154,609,820)
2016	Investment Loss	L	30	184,262,638	29	182,559,923	15,328,694	180,709,131
2017	Discount Rate Change (7.70%)	L	30	135,132,845	30	135,132,845	11,240,656	133,872,677
2017	Experience Gain	L	30	(197,209,072)	30	(197,209,072)	(16,404,298)	(195,370,018)
2017	Investment Gain	L	30	(19,782,999)	30	(19,782,999)	(1,645,595)	(19,598,514)
2017	Exp Acct Allocation	L	30	9,891,500	10	9,891,500	1,401,291	9,198,905
Total				$11,798,859,763		$ 10,549,563,659	$ 1,004,883,453	$ 10,319,025,976
Employers Credit Balance								
2013	Contribution Variance	L	5	$ 11,400,601	1	$ 2,635,249	$ 2,734,825	$ -
Total				$ 11,400,601		$ 2,635,249	$ 2,734,825	$ -
Grand Total						**$ 10,552,198,908**	**$ 1,007,618,278**	**$ 10,319,025,976**

8. Amortization Payments for FYE 2019

Year	Description	Amortization Method	Amortization Period	Initial Liability	Years Remaining	Balance on June 30, 2018	Mid-Year Payment	Balance on June 30, 2019
Shared Bases								
2010	Orig Amort Base	I	19	$ 2,677,501,778	11	$ 1,989,632,065	$ 272,875,761	$ 1,841,997,289
2010	Exp Acct Amort Base	I	30	3,999,115,151	22	3,389,269,876	352,621,733	3,253,717,200
2009	Change in Liability	L	30	2,979,708,647	21	2,649,671,934	231,943,844	2,588,880,661
2010	Change in Liability	L	30	1,150,854,854	22	1,041,795,143	89,276,676	1,019,875,750
2011	Change in Liability	L	30	(175,198,199)	23	(161,187,360)	(13,545,971)	(158,071,824)
2012	Change in Liability	L	30	125,767,665	24	117,430,240	9,693,172	115,341,806
2013	Change in Liability	L	30	(248,560,781)	25	(235,227,305)	(19,098,445)	(231,372,655)
2013	Assumption Change	L	30	871,681,891	25	824,922,498	66,976,649	811,404,565
2013	Asset Valuation Method	L	30	(25,686,598)	25	(24,308,698)	(1,973,658)	(23,910,354)
2014	Liability Gain	L	30	(162,364,783)	26	(155,613,841)	(12,443,496)	(153,261,169)
2014	Assumption Change	L	30	570,933,583	26	547,194,820	43,755,853	538,921,970
2014	Funding Method	L	30	881,187,059	26	844,548,309	67,533,409	831,779,875
2014	Reduction in EA Deposit	L	5	(76,831,515)	1	(17,737,405)	(18,326,268)	-
2014	Gain from $100-$200M	L	5	(100,000,000)	1	(23,086,107)	(23,852,541)	-
2014	Remaining Investment Gain	L	5	(247,166,403)	1	(57,061,098)	(58,955,465)	-
2015	Experience Gain	L	30	(37,106,169)	27	(35,992,382)	(2,837,900)	(35,489,753)
2015	Investment Gain	L	30	(339,621,226)	27	(329,427,074)	(25,974,419)	(324,826,660)
2016	Experience Gain	L	30	(157,650,103)	28	(154,609,820)	(12,033,143)	(152,613,353)
2016	Investment Loss	L	30	184,262,638	28	180,709,131	14,064,429	178,375,645
2017	Discount Rate Change (7.70%)	L	30	135,132,845	29	133,872,677	10,294,661	132,272,650
2017	Experience Gain	L	30	(197,209,072)	29	(195,370,018)	(15,023,739)	(193,034,983)
2017	Investment Gain	L	30	(19,782,999)	29	(19,598,514)	(1,507,104)	(19,364,275)
2017	Exp Acct Allocation	L	30	9,891,500	9	9,198,905	1,352,043	8,422,902
2018	Mortality Assump Change	L	30	1,213,942,683	30	1,213,942,683	92,317,260	1,200,501,721
2018	DR/Sal Infl Assump Change	L	30	4,771,419,083	30	4,771,419,083	362,854,310	4,718,589,192
2018	Admin Expense Method Change	L	30	(363,619,408)	30	(363,619,408)	(27,652,333)	(359,593,358)
2018	COLA Method Change	L	30	7,869,465	30	7,869,465	598,453	7,782,333
Total				$17,428,471,586		$ 15,948,637,799	$ 1,382,933,771	$ 15,596,325,175
Employers Credit Balance								
2018	Contribution Variance	L	5	343,449	5	343,449	80,531	283,427
Total				$ 343,449		$ 343,449	$ 80,531	$ 283,427
Grand Total						**$ 15,948,981,248**	**$ 1,383,014,302**	**$ 15,596,608,602**

SECTION II
VALUATION OF THE GAIN-SHARING COLA PROGRAM

1. Actuarial Basis for the Valuation of the Gain-Sharing COLA Program

A. Challenges in Interpreting Louisiana Law

The current gain-sharing COLA program was originally enacted during the 1991 legislative session. The program contained two components:

1. **Gain-sharing** – A portion of investment gains (and until 2004, investment losses) was to be transferred from the pool of assets reserved for regular retirement benefits to the Experience Account, which would be used to fund COLAs. Funds would remain in the Experience Account until a COLA was granted. The law limited the amount of assets that could be held in the Experience Account to no more than two times the cost of a full COLA. Whenever a COLA was granted, assets equal to the present value of the COLA benefits granted were then transferred back to the regular pool of assets to cover the COLA liabilities that had been created.

2. **COLAs** – COLAs would be granted if specified conditions were satisfied and if there were sufficient assets in the Experience Account to cover the additional liability created by the COLA grant.

Although the program has been modified several times since its inception, the basic format has remained unchanged; there is a gain-sharing component and a COLA grant component.

The gain-sharing component is a legislative mandate. Transfers to the Experience Account occur automatically. No approvals are necessary; if the conditions are satisfied, a transfer must occur unless the Experience Account has been capped out.

The COLA component is not a legislative mandate. Historically and currently, a COLA can be granted only if specified conditions are satisfied, there are sufficient assets in the Experience Account to pay for the COLA, and the COLA grant is approved by the TRSL's board and the legislature.

The structure of the gain-sharing COLA program creates an actuarial dilemma. If we assume the COLA component is not part of current law, then the only liability that must be accounted for are transfers to the Experience Account. However, if COLA grants are not part of current law, then the Experience Account will reach its limit and no additional transfers will occur. The only additional liability that will be incurred by the system is the difference between the Experience Account limit and the amount already in the Experience Account.

Alternatively, if we assume the COLA component is part of current law, we must further assume the frequency for which the TRSL's board will recommend and the legislature will enact a COLA payment when all other conditions necessary for a COLA grant have been satisfied. Monte Carlo simulations then allow us to estimate the average annual transfer to the Experience Account.

In light of the discussion set forth above, we have valued the gain-sharing COLA program in accordance with the following assumptions and methods.

1. The COLA component is part of current law that must be valued.

2. The TRSL board and the legislature will grant a COLA if there are sufficient funds in the Experience Account and if all other necessary conditions have been satisfied.

Using stochastic modeling, we can then determine the portion of the investment return assumption that must be allocated to pay for estimated transfers to the Experience Account. We have determined the COLA assumption should be a 0.50% annual COLA for the gain-sharing COLA program. This is our current best estimate. This estimate may change for future valuations as circumstances change.

B. Gains and Losses Associated with the Gain-Sharing COLA Account

If the automatic COLA used to value plan liabilities is 0.50% per year, then funding for the gain-sharing COLA program has been accounted for actuarially. An experience gain will occur if no COLA is granted or a smaller COLA than 0.50% is granted with funds in the Experience Account. An experience loss will occur if a COLA is granted larger than 0.50%.

The Louisiana Constitution provides the following.

> *F) Benefit Provisions; Legislative Enactment. Benefit provisions for members of any public retirement system, plan, or fund that is subject to legislative authority shall be altered only by legislative enactment. No such benefit provisions having an actuarial cost shall be enacted unless approved by two-thirds of the elected members of each house of the legislature. Furthermore, no such benefit provision for any member of a state retirement system having an actuarial cost shall be approved by the legislature unless a funding source providing new or additional funds sufficient to pay all such actuarial cost within ten years of the effective date of the benefit provision is identified in such enactment. This Paragraph shall be implemented as provided by law.*
>
> Underlining added to identify relevant content.

For the purpose of this valuation, we have assumed that the constitutional language applies only if the COLA approved by the legislature exceeds that which would have been granted under current law. Therefore, an additional liability is created only to the extent that the cost of the COLA grant exceeds the cost of the COLA grant that otherwise would be available under current law. Such an increase would be subject to 10-year amortization.

C. Experience Account Transfers for the June 30, 2017 Valuation

Investment gains were transferred to the Experience Account on June 30, 2017. Investment gains for FYE 2017 were more than the roughly $217.7 million threshold applicable for FYE 2017. Calculations associated with this analysis are shown in Section I(5)(C).

2. Summary of Benefit Provisions for the Gain-Sharing COLA Program

Benefit and funding provisions associated with the TRSL gain-sharing COLA program are contained in R.S. 11:102.2 and 11:883.1. According to R.S. 11:883.1, a special account, called the Experience Account, is established and maintained to fund COLAs. Experience Account rules have changed several times since the Account's inception in 1991. For example, Act 497 of the 2009 session required all funds in the Experience Account to be transferred back to the regular pool of assets. The balance in the Experience Account was set to $0. Additional changes were made to Experience Account rules by Act 399 of the 2014 session. Provisions associated with the gain-sharing COLA program as amended through Act 399 are summarized below.

A. Experience Account Provisions

Rules pertaining to debits and credits to the Experience Account are summarized below.

1. The first transaction on June 30 of a given year is the transfer of assets from the Experience Account, if any, to the regular pool of assets to offset the liability associated with any COLA grant that becomes effective on the next day, July 1.

2. The second transaction is the transfer of investment earnings on the balance in the Experience Account on the July 1 prior to the valuation date. Assets in the Experience Account are invested in the same manner as assets in the regular pool of assets. The Experience Account is credited with investment earnings based on the actuarial rate of return on assets for the system as a whole. The following rules apply.

    a. If the Experience Account balance on the prior July 1 plus investment earnings for the FYE on the valuation date is less than the maximum amount allowed in the Experience Account on the valuation date, then all investment earnings on the July 1 balance may be credited.

    b. If the Experience Account balance on the prior July 1 plus investment earnings for the FYE on the valuation date equals or exceeds the maximum amount allowed in the Experience Account on the valuation date, then investment earnings on the Experience Account balance will be reduced sufficiently to restrict the Experience Account balance on the valuation date to the maximum limit.

    c. Any investment earnings not credited to the Experience Account are transferred to or retained by the regular pool of assets.

    d. These credits, if any, occur on the June 30 valuation date.

3. The third transaction is the transfer of the allocation of investment gains as calculated in accordance with TRSL's interpretation of the law. On each valuation date, TRSL calculates the amount of investment gain or loss that has occurred during the system's fiscal year. The investment gain for this purpose, based on an interpretation of law made by the legal staff for TRSL, increases the investment gain that otherwise would be calculated. Under TRSL's interpretation, the ***actual*** investment gain is calculated net of investment expenses, but the ***expected*** investment gain is determined as net of investment expenses, net of administrative expenses and net of gain-sharing. The following rules apply.

   a. This transaction occurs after items 1 and 2 have been completed.

   b. Fifty percent (50%) of any investment gain as determined by TRSL that exceeds a specified threshold (currently set at $200 million) potentially will be transferred from the regular pool of assets to the Experience Account. The effective date of this transfer is June 30 of the fiscal year in which the investment gain occurs. The $200 million threshold is indexed: the threshold value will increase (but not decrease) in any year by the ratio of the actuarial value of assets at the end of the year to the actuarial value of assets at the beginning of the year. The first such increase may occur no earlier than June 30, 2016.

   c. The transfer amount may not exceed the amounts shown in Table 1.

Table 1

Funded Ration on Valuation Date	Transfer May Not Exceed:
At least 80%	The difference between **two** times the cost of a full 3% COLA and the amount already in the Experience Account.
At least 75% but less than 80%	The difference between the cost of a full 2.5% COLA and the amount already in the Experience Account.
At least 65% but less than 75%	The difference between the cost of a full 2.0% COLA and the amount already in the Experience Account.
At least 55% but less than 65%	The difference between the cost of a full 1.5% COLA and the amount already in the Experience Account.
Less than 55%	No transfer is allowed.

   d. If the Experience Account balance (on June 30) plus the investment gain allocation to the Experience Account is less than the maximum amount allowed in the Experience Account, then the full allocation will be transferred from the regular pool of assets and credited to the Experience Account.

e. If the Experience Account balance plus the investment gain allocation equals or exceeds the maximum amount, then the allocation is reduced sufficiently to restrict the Experience Account on the valuation date to the maximum.

f. Any gain allocation not transferred to the Experience Account is retained by the regular pool of assets.

g. These credits, if any, will occur on the June 30 valuation date.

The value of the Experience Account balance cannot be less than $0, except under special circumstances.

B. Benefit Provisions

Current law provides a legal template that the legislature may choose to adopt in the enactment of cost-of-living adjustment. This template specifies eligibility criteria, which is generally age 60 with one year of retirement, and the basis for the amount of a COLA grant, which is the CPI-U. There is no requirement that COLA legislation follow the template. Nor is there any guarantee that COLAs in the future will even be based on the balance in the Experience Account.

The COLA template contains the following provisions:

1. Eligibility:

   The following retirees and beneficiaries of TRSL will be eligible for a COLA to be paid on the July 1 following the date the board of trustees and the legislature approve a COLA.

   a. Each retiree who satisfies all of the following criteria on the July 1 immediately following the valuation date:

      - Has received a benefit for at least one year, and
      - Has attained at least age 60.

   b. Each non-retiree beneficiary (including each survivor of a deceased active member) receiving a benefit on the July 1 immediately following the valuation date who satisfies all of the following criteria:

      - The deceased member or beneficiary or both combined have received benefits for at least one year, and
      - The deceased member would have been at least age 60 had he lived.

c. Each disability retiree and each beneficiary who is receiving benefits based on the death of a disability retiree, who also on the valuation date has been receiving benefits for at least one year.

2. COLAs:

a. The maximum COLA that may be granted on the July 1 immediately following the valuation date is equal to the lesser of:

1). 3% x the benefit payable on the valuation date, or:

2). The increase in the CPI-U for the calendar year immediately prior to the valuation date (December to December) x the benefit payable on the valuation date.

b. If the rate of return on the actuarial value of assets for the FYE on the June 30 prior to the valuation date is less than 8.25% (8.25% is hard coded into the law), then a COLA may be granted on July 1. However, the maximum COLA that may be granted is the lesser of:

1). 2% x the benefit payable on the valuation date, or:

2). The increase in the CPI-U for the calendar year immediately prior to the valuation date (December to December) x the benefit payable on the valuation date.

c. No COLA may be granted on July 1 if the actuarial return on system assets for the FYE on the June 30 prior to the valuation date is less than the discount rate on that date (currently 7.70%) and the funded ratio of the system is less than 80%.

d. If the balance in the Experience Account is less than the actuarial present value of the full COLA determined above, then no COLA may be granted.

e. COLAs will be based on the portion of a retiree's benefit on the valuation date that is less than $60,000. This limit is indexed to the CPI-U.

3. The amount of COLA that may be granted in a single year also depends on the funded ratio of the system (see Table 2 on the next page).

Table 2

Funded Percentage of the System	Maximum COLA Percentage
At least 80%	3.00%
At least 75% but less than 80%	2.50%
At least 65% but less than 75%	2.00%
At least 55% but less than 65%	1.50%
Less than 55%	No COLA

C. Approval Process

Prior to the June 30, 2011 Valuation

A COLA potentially becomes payable whenever there is an increase in the cost of living based on the Consumer Price Index for all urban consumers (CPI-U) and other specified numerical measures are satisfied. Prior to June 30, 2011, a COLA could be granted only in accordance with the following approval process.

1. The actuary for TRSL must determine that the necessary conditions exist for a COLA to be granted and then determines the actuarial cost that will be incurred by the Experience Account should such an increase be approved.

2. TRSL's actuary must also declare that there are sufficient dollars in the Experience Account to cover the actuarial cost of the COLA.

3. The actuary for the Louisiana Legislative Auditor must review the actuarial cost analysis and must not disagree with the assessment prepared by the TRSL's actuary.

4. TRSL's board of trustees must approve the COLA.

5. TRSL's board of trustees must ask the Speaker of the House and the President of the Senate for a concurrent resolution to authorize the COLA. A COLA is granted with a 50% majority vote by the legislature on the concurrent resolution.

6. The COLA becomes effective on the first day of the fiscal year following the legislative session.

Effective with the June 30, 2011 Valuation

As discussed above, we believe it is more likely than not that COLAs will be granted only if a bill to make such a grant is introduced to the legislature, the bill passes both houses with a two-thirds vote, and is then signed into law by the governor. This is not to be construed as a legal opinion. It is merely our best judgment based on information available to us during the preparation of this valuation report.

This valuation has recognized a liability associated with automatic transfers of investment gains to the Experience Account.

3. Compliance with Actuarial Standards of Practice

The method we are using to account for TRSL's gain-sharing COLA program as described in Section II(1)(A) and (B) complies with Actuarial Standards of Practice.

According to Section 3.5.3 of Actuarial Standards of Practice No. 4:

> *Plan Provisions that are Difficult to Measure— Some **plan provisions** may create pension obligations that are difficult to appropriately measure using traditional valuation procedures. Examples of such **plan provisions** include the following:*
>
> *a. gain sharing provisions that trigger benefit increases when investment returns are favorable but do not trigger benefit decreases when investment returns are unfavorable;*
> *b. floor-offset provisions that provide a minimum defined benefit in the event a **participant's** account balance in a separate plan falls below some threshold;*
> *c. benefit provisions that are tied to an external index, but subject to a floor or ceiling, such as certain cost of living adjustment provisions and cash balance crediting provisions; and*
> *d. benefit provisions that may be triggered by an event such as a plan shutdown or a change in control of the plan sponsor.*
>
> *For such **plan provisions**, the actuary **should consider** using alternative valuation procedures, such as stochastic modeling, option-pricing techniques, or deterministic procedures in conjunction with assumptions that are adjusted to reflect the impact of variations in experience from year to year. When selecting alternative valuation procedures for such **plan provisions**, the actuary should use professional judgment based on the purpose of the measurement and other relevant factors.*

According to Section 2.1 of Actuarial Standards of Practice No. 1:

> *The words "must" and "should" are used to provide guidance in the ASOPs. "Must" as used in the ASOPs means that the ASB does not anticipate that the actuary will have any reasonable alternative but to follow a particular course of action. In contrast, the word "should" indicates what is normally the appropriate practice for an actuary to follow when rendering actuarial services. Situations may arise where the actuary applies professional judgment and concludes that complying with this practice would be inappropriate, given the nature and purpose of the assignment and the principal's needs, or that under the circumstances it would not be reasonable or practical to follow the practice.*
>
> *Failure to follow a course of action denoted by either the term "must" or "should" constitutes a deviation from the guidance of the ASOP. In either event, the actuary is directed to ASOP No. 41, Actuarial Communications.*

The terms "must" and "should" are generally followed by a verb or phrase denoting action(s), such as "disclose," "document," "consider," or "take into account." For example, the phrase "should consider" is often used to suggest potential courses of action. If, after consideration, in the actuary's professional judgment an action is not appropriate, the action is not required and failure to take this action is not a deviation from the guidance in the standard.

Bold, italics and underline have been added for emphasis and identification.

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SECTION III
BASIS FOR THE VALUATION

1. Introduction

The June 30, 2017, valuation is used to determine actuarial liabilities as of June 30, 2017, actual employer contribution requirements for FYE 2018, and projected employer contribution requirements for FYE 2019. Census data, actuarial methods, and actuarial assumptions used in the preparation of June 30, 2017, assets, liabilities, and employer contribution requirements for FYE 2018 are shown in this section of the report. Additional information is provided whenever a change has been made since the June 30, 2016, valuation or it is expected that a change will be made in the preparation of the June 30, 2018, valuation.

2. Census Data

Census data used in the preparation of the June 30, 2017, valuation is summarized below. The census data was provided by TRSL. The accuracy of the data was confirmed by Financial Audit Services within the Louisiana Legislative Auditor. A comparison with census summaries prepared by the TRSL's actuary confirmed the reasonability of the census data used in preparing this report.

	June 30 Valuation Date		
Membership Status	**2017**	**2016**	**2015**
Regular Teachers	71,458	71,511	70,881
Higher Education	9,186	8,792	8,803
Lunch Plan A	6	8	10
Lunch Plan B	1,121	1,162	1,192
Post DROP	2,457	2,595	2,716
Total Active Members	**84,228**	**84,068**	**83,602**
Retired and Inactive Members			
Regular Retirees	65,749	64,593	63,819
Disability Retirees	4,280	4,238	4,121
Survivors	7,229	6,997	6,772
DROP Participants	2,478	2,504	2,283
Vested & Reciprocal	6,941	6,687	6,606
Inactive Non-Vested (Due Refunds)	20,980	19,842	19,005
Total Inactive Members	**107,657**	**104,861**	**102,606**
Total Active and Inactive Members	**191,885**	**188,929**	**186,208**
Terminated Due Refund	(20,980)	(19,842)	(19,005)
Total Members	**170,905**	**169,087**	**167,203**

Membership Reconciliation

	Active (Pre DROP)	Active After DROP	Terminated Vested	In DROP	Retired, Disabled, Survivor	Total
Members on June 30, 2016	81,473	2,595	6,687	2,504	75,828	169,087
Additions to Census						
Added to Membership	7,803					7,803
Total Additions	7,803					7,803
Change in Status						
Active to Term Vested	(1,199)		1,199			
Active to In DROP	(951)			951		
Active to Retired	(1,495)				2,801	1,306
Active to Disabled	(180)				196	16
Active to Survivor	(35)				46	11
Terminated Vested to Active	414		(414)			
Terminated Vested to In DROP			(4)	4		
Terminated Vested to Retiree			(193)			(193)
Terminated to Disabled			(16)			(16)
Terminated to Survivor			(11)			(11)
In DROP to Active after DROP		434		(434)		
In DROP to Retired/Survivor				(542)		(542)
Active after DROP to Retired		(571)				(571)
Active after DROP to Survivor						
Disabled to Active	1				(1)	
Disabled to Terminated Vested			1		(1)	
Retired to Active						
Total Changes	(3,445)	(137)	562	(21)	3,041	
Eliminated from Census						
Refunded or Due Refund	(3,993)		(330)			(4,323)
Deceased	(49)	(2)	(20)	(5)	(1,664)	(1,740)
Total Eliminated	(4,042)	(2)	(350)	(5)	(1,664)	(6,063)
Data Revisions	(18)	1	42	-	53	78
Members on June 30, 2017	81,771	2,457	6,941	2,478	77,258	170,905

TRSL MEMBERSHIP PROFILE
ALL ACTIVE MEMBERS
(PRE-DROP)

CELLS DEPICT **Member Count**
Total Salary

Valuation Date **6/30/2017**

Age/Service	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	TOTAL
<25	807	947	1	-	-	-	-	-	-	1,755
	$ 34,770,588	$ 37,942,879	$ 16,744	-	-	-	-	-	-	$ 72,730,211
25-29	1,201	5,253	978	1	-	-	-	-	-	7,433
	$ 51,039,520	$ 219,807,631	$ 44,618,163	21,999	-	-	-	-	-	$ 315,487,313
30-34	965	3,935	3,866	1,125	1	-	-	-	-	9,892
	$ 43,126,365	$ 163,175,329	$ 179,963,440	$ 56,355,467	26,455	-	-	-	-	$ 442,647,056
35-39	840	3,189	2,928	3,831	1,044	2	-	-	-	11,834
	$ 35,847,876	$ 127,495,133	$ 133,301,797	$ 194,578,267	$ 56,766,332	$ 53,943	-	-	-	$ 548,043,348
40-44	626	2,453	2,234	2,548	3,149	788	1	-	-	11,799
	$ 27,115,977	$ 98,413,490	$ 99,767,020	$ 123,195,019	$ 175,138,321	$ 45,654,737	$ 33,352	-	-	$ 569,317,916
45-49	491	2,015	2,058	2,229	2,306	2,616	697	-	-	12,412
	$ 20,614,670	$ 77,721,956	$ 85,846,402	$ 100,003,483	$ 119,627,206	$ 153,550,631	$ 42,360,322	-	-	$ 599,724,670
50-54	399	1,464	1,568	1,881	1,856	1,749	2,131	94	2	11,144
	$ 17,206,076	$ 53,531,085	$ 63,647,574	$ 78,014,784	$ 83,919,475	$ 90,333,352	$ 127,055,267	$ 6,327,429	118,726	$ 520,153,768
55-59	288	1,163	1,187	1,481	1,698	1,637	321	117	32	7,924
	$ 12,142,015	$ 44,077,021	$ 48,661,548	$ 59,525,265	$ 72,318,553	$ 75,574,093	$ 16,759,318	$ 8,472,453	$ 2,108,817	$ 339,639,083
60-64	157	615	744	928	891	966	323	113	112	4,849
	$ 6,761,034	$ 24,733,434	$ 30,430,223	$ 39,532,965	$ 39,145,084	$ 45,352,554	$ 17,059,374	$ 7,997,052	$ 10,038,876	$ 221,050,596
65-69	73	215	291	341	295	311	258	118	76	1,978
	$ 2,732,899	$ 8,505,977	$ 13,019,811	$ 15,285,291	$ 14,370,153	$ 14,712,432	$ 13,099,794	$ 8,579,410	$ 7,114,555	$ 97,420,322
70+	27	79	111	122	91	74	87	80	80	751
	$ 1,490,654	$ 3,143,889	$ 4,937,479	$ 5,730,012	$ 4,881,076	$ 3,325,317	$ 4,437,754	$ 5,744,783	$ 8,119,713	$ 41,810,677
TOTAL	5,874	21,328	15,966	14,487	11,331	8,143	3,818	522	302	81,771
	$ 252,847,674	$ 858,547,824	$ 704,210,201	$ 672,242,552	$ 566,192,655	$ 428,557,059	$ 220,805,181	$ 37,121,127	$ 27,500,687	$ 3,768,024,960

AVERAGES		
	Attained Age	44.38
	Service Years	10.65
	Annual Salary	$46,080

TRSL MEMBERSHIP PROFILE
Active - Regular K-12

CELLS DEPICT **Member Count**
Total Salary

Valuation Date **6/30/2017**

Age/Service	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	TOTAL
<25	659	881	1	-	-	-	-	-	-	1,541
	$ 28,011,356	$ 35,786,635	$ 16,744	-	-	-	-	-	-	$ 63,814,735
25-29	941	4,760	928	1	-	-	-	-	-	6,630
	$ 38,940,875	$ 199,959,932	$ 42,327,941	21,999	-	-	-	-	-	$ 281,250,747
30-34	718	3,315	3,529	1,079	1	-	-	-	-	8,642
	$ 29,045,523	$ 132,615,673	$ 163,384,534	$ 53,847,545	26,455	-	-	-	-	$ 378,919,730
35-39	649	2,653	2,528	3,559	1,013	2	-	-	-	10,404
	$ 24,717,136	$ 98,157,236	$ 111,035,566	$ 179,443,920	$ 55,007,909	$ 53,943	-	-	-	$ 468,415,710
40-44	478	2,058	1,934	2,255	3,032	773	1	-	-	10,531
	$ 18,238,108	$ 75,943,782	$ 81,571,641	$ 105,838,379	$ 167,760,832	$ 44,680,668	$ 33,352	-	-	$ 494,066,762
45-49	367	1,712	1,759	1,961	2,160	2,516	678	-	-	11,153
	$ 13,667,928	$ 61,745,132	$ 68,954,920	$ 84,070,742	$ 110,175,302	$ 146,599,994	$ 41,104,322	-	-	$ 526,318,340
50-54	307	1,202	1,289	1,624	1,696	1,627	2,057	83	2	9,887
	$ 11,267,042	$ 40,191,087	$ 48,706,552	$ 63,417,503	$ 75,521,200	$ 83,439,898	$ 122,294,894	$ 5,524,700	118,726	$ 450,481,602
55-59	219	901	932	1,241	1,529	1,510	267	101	26	6,726
	$ 7,960,874	$ 29,540,634	$ 34,565,297	$ 46,145,988	$ 63,115,617	$ 68,735,169	$ 13,972,354	$ 7,114,562	$ 1,824,657	$ 272,975,152
60-64	117	451	547	764	798	896	271	62	77	3,983
	$ 4,626,489	$ 14,976,024	$ 18,958,599	$ 29,351,226	$ 33,753,822	$ 41,079,333	$ 13,085,301	$ 3,279,059	$ 6,268,116	$ 165,377,969
65-69	50	150	206	272	240	266	213	74	30	1,501
	$ 1,675,748	$ 4,923,953	$ 7,903,375	$ 10,136,000	$ 10,594,233	$ 11,918,479	$ 9,732,228	$ 3,944,991	$ 2,080,767	$ 62,909,774
70+	15	48	71	72	56	58	68	45	27	460
	$ 508,472	$ 1,518,787	$ 2,241,227	$ 2,601,093	$ 2,138,345	$ 2,340,711	$ 2,982,874	$ 1,765,759	$ 1,435,233	$ 17,532,501
TOTAL	4,520	18,131	13,724	12,828	10,525	7,648	3,555	365	162	71,458
	$ 178,659,552	$ 695,358,875	$ 579,666,396	$ 574,874,395	$ 518,093,715	$ 398,848,195	$ 203,205,325	$ 21,629,071	$ 11,727,499	$ 3,182,063,023

AVERAGES

Attained Age	44.11
Service Years	10.95
Annual Salary	$44,531

TRSL MEMBERSHIP PROFILE
Active - Higher Education

CELLS DEPICT **Member Count**
Total Salary

Valuation Date **6/30/2017**

Age/Service	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	TOTAL
<25	144	61	-	-	-	-	-	-	-	205
	$ 6,691,095	$ 2,080,897	-	-	-	-	-	-	-	$ 8,771,992
25-29	252	476	50	-	-	-	-	-	-	778
	$ 11,952,966	$ 19,561,500	$ 2,290,222	-	-	-	-	-	-	$ 33,804,688
30-34	237	595	328	45	-	-	-	-	-	1,205
	$ 13,873,337	$ 30,106,555	$ 16,424,667	$ 2,490,561	-	-	-	-	-	$ 62,895,120
35-39	176	501	381	264	29	-	-	-	-	1,351
	$ 10,876,936	$ 28,719,823	$ 21,908,222	$ 14,978,225	$ 1,689,717	-	-	-	-	$ 78,172,923
40-44	138	363	279	276	115	13	-	-	-	1,184
	$ 8,692,099	$ 21,925,388	$ 17,806,847	$ 17,011,397	$ 7,340,327	$ 935,850	-	-	-	$ 73,711,908
45-49	108	261	262	233	133	97	18	-	-	1,112
	$ 6,649,462	$ 15,262,596	$ 16,193,796	$ 15,235,669	$ 9,163,353	$ 6,872,943	$ 1,237,953	-	-	$ 70,615,772
50-54	78	202	214	204	116	99	67	6	-	986
	$ 5,671,362	$ 12,301,603	$ 13,786,985	$ 13,504,994	$ 7,513,902	$ 6,353,756	$ 4,615,785	$ 673,409	-	$ 64,421,796
55-59	56	201	207	185	125	83	31	15	4	907
	$ 3,934,375	$ 13,419,839	$ 13,317,401	$ 12,333,762	$ 8,344,175	$ 5,859,014	$ 2,294,785	$ 1,329,590	$ 235,645	$ 61,068,586
60-64	36	140	155	143	78	61	49	48	33	743
	$ 2,068,973	$ 9,351,064	$ 10,743,102	$ 9,821,489	$ 5,072,015	$ 4,016,503	$ 3,900,312	$ 4,665,868	$ 3,719,450	$ 53,358,776
65-69	20	54	75	66	53	44	43	43	46	444
	$ 1,004,157	$ 3,411,211	$ 4,939,574	$ 5,097,702	$ 3,729,453	$ 2,777,153	$ 3,265,918	$ 4,619,552	$ 5,033,788	$ 33,878,508
70+	12	28	35	43	33	16	17	35	52	271
	$ 982,181	$ 1,575,994	$ 2,608,793	$ 3,019,497	$ 2,707,789	$ 984,606	$ 1,419,889	$ 3,979,024	$ 6,650,719	$ 23,928,492
TOTAL	1,257	2,882	1,986	1,459	682	413	225	147	135	9,186
	$ 72,396,944	$ 157,716,470	$ 120,019,609	$ 93,493,296	$ 45,560,731	$ 27,799,825	$ 16,734,642	$ 15,267,443	$ 15,639,602	$ 564,628,562

AVERAGES

Attained Age	45.58
Service Years	8.45
Annual Salary	$61,466

TRSL MEMBERSHIP PROFILE
Active - School Lunch Plan A

CELLS DEPICT **Member Count**
Total Salary

Valuation Date **6/30/2017**

Age/Service	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	TOTAL
<25	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
50-54	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-	1	1
	-	-	-	-	-	-	-	-	$ 24,401	$ 24,401
60-64	-	-	-	-	-	-	-	2	1	3
	-	-	-	-	-	-	-	$ 32,826	$ 30,128	$ 62,954
65-69	-	-	-	-	-	-	1	-	-	1
	-	-	-	-	-	-	$ 27,270	-	-	$ 27,270
70+	-	-	-	-	-	-	-	-	1	1
	-	-	-	-	-	-	-	-	$ 33,761	$ 33,761
TOTAL	-	-	-	-	-	-	1	2	3	6
	-	-	-	-	-	-	$ 27,270	$ 32,826	$ 88,290	$ 148,386

AVERAGES

Attained Age	63.70
Service Years	34.68
Annual Salary	$24,731

TRSL MEMBERSHIP PROFILE
Active - School Lunch Plan B

CELLS DEPICT **Member Count**
Total Salary

Valuation Date **6/30/2017**

Age/Service	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	TOTAL
<25	4	5	-	-	-	-	-	-	-	9
	$ 68,137	$ 75,347	-	-	-	-	-	-	-	$ 143,484
25-29	8	17	-	-	-	-	-	-	-	25
	$ 145,678	$ 286,199	-	-	-	-	-	-	-	$ 431,877
30-34	10	25	9	1	-	-	-	-	-	45
	$ 207,505	$ 453,101	$ 154,239	17,361	-	-	-	-	-	$ 832,206
35-39	15	35	19	8	2	-	-	-	-	79
	$ 253,804	$ 618,074	$ 358,009	$ 156,122	$ 68,706	-	-	-	-	$ 1,454,715
40-44	10	32	21	17	2	2	-	-	-	84
	$ 185,770	$ 544,320	$ 388,532	$ 345,243	$ 37,162	$ 38,219	-	-	-	$ 1,539,246
45-49	16	42	37	35	13	3	1	-	-	147
	$ 297,279	$ 714,228	$ 697,686	$ 697,072	$ 288,551	$ 77,694	18,047	-	-	$ 2,790,557
50-54	14	60	65	53	44	23	7	5	-	271
	$ 267,672	$ 1,038,395	$ 1,154,037	$ 1,092,287	$ 884,373	$ 539,698	$ 144,588	$ 129,320	-	$ 5,250,370
55-59	13	61	48	55	44	44	23	1	1	290
	$ 246,766	$ 1,116,548	$ 778,850	$ 1,045,515	$ 858,761	$ 979,910	$ 492,179	$ 28,301	$ 24,114	$ 5,570,944
60-64	4	24	42	21	15	9	3	1	1	120
	$ 65,571	$ 406,346	$ 728,522	$ 360,250	$ 319,247	$ 256,718	$ 73,761	$ 19,299	$ 21,182	$ 2,250,896
65-69	3	11	10	3	2	1	1	1	-	32
	$ 52,995	$ 170,813	$ 176,862	$ 51,589	$ 46,467	$ 16,800	$ 74,378	14,867	-	$ 604,771
70+	-	3	5	7	2	-	2	-	-	19
	-	$ 49,108	$ 87,459	$ 109,422	$ 34,942	$ -	$ 34,991	-	-	$ 315,922
TOTAL	97	315	256	200	124	82	37	8	2	1,121
	$ 1,791,178	$ 5,472,479	$ 4,524,196	$ 3,874,861	$ 2,538,209	$ 1,909,039	$ 837,944	$ 191,787	$ 45,296	$ 21,184,989

AVERAGES

Attained Age	51.59
Service Years	9.45
Annual Salary	$18,898

TRSL MEMBERSHIP PROFILE
DROP Participants

CELLS DEPICT **Member Count**
Total Benefits

Valuation Date **6/30/2017**

Age/Years Retired	<1	1	2	3	4-5	6-10	11-15	16-20	20+	TOTAL
<40	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
45-49	1	2	-	-	-	-	-	-	-	3
	$ 33,828	$ 52,140	-	-	-	-	-	-	-	$ 85,968
50-54	-	1	-	-	-	-	-	-	-	1
	-	$ 60,420	-	-	-	-	-	-	-	$ 60,420
55-59	741	615	527	22	-	-	-	-	-	1,905
	$ 28,416,576	$ 23,640,204	$ 19,768,176	$ 993,612	-	-	-	-	-	$ 72,818,568
60-64	162	194	189	5	-	-	-	-	-	550
	$ 3,556,572	$ 4,377,540	$ 4,290,480	$ 152,136	-	-	-	-	-	$ 12,376,728
65-69	6	3	7	-	-	-	-	-	-	16
	$ 44,316	$ 17,196	$ 42,552	-	-	-	-	-	-	$ 104,064
70-74	1	-	1	-	-	-	-	-	-	2
	$ 9,024	-	$ 3,168	-	-	-	-	-	-	$ 12,192
75-79	1	-	-	-	-	-	-	-	-	1
	$ 5,316	-	-	-	-	-	-	-	-	5,316
80-84	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
85-89	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
90+	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
TOTAL	912	815	724	27	-	-	-	-	-	2,478
	$ 32,065,632	$ 28,147,500	$ 24,104,376	$ 1,145,748	-	-	-	-	-	$ 85,463,256

AVERAGES

Attained Age	57.22
Years Retired	1.33
Yearly Benefit	$34,489

TRSL MEMBERSHIP PROFILE
Active After DROP

CELLS DEPICT **Member Count**
Total Salary
Total Benefit

Valuation Date **6/30/2017**

Age/Credited Service	<1	1	2	3	4	5-9	10-14	15-19	20+	TOTAL
<44	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
44-49	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
50-54	17	3	-	-	-	-	-	-	-	20
	$ 612,708	$ 111,883	-	-	-	-	-	-	-	$ 724,591
	$ 723,084	$ 82,452	-	-	-	-	-	-	-	$ 805,536
55-59	217	185	79	62	38	24	-	-	-	605
	$ 7,467,868	$ 11,632,254	$ 5,272,499	$ 3,523,916	$ 2,398,301	$ 1,264,660	-	-	-	$ 31,559,498
	$ 8,275,644	$ 7,551,864	$ 3,560,100	$ 2,352,780	$ 1,588,980	$ 781,788	-	-	-	$ 24,111,156
60-64	176	134	149	100	128	331	4	-	-	1,022
	$ 4,672,888	$ 6,777,387	$ 8,035,709	$ 5,496,332	$ 7,547,773	$ 21,862,231	-	-	-	$ 54,392,320
	$ 4,281,612	$ 3,269,208	$ 4,804,968	$ 3,347,424	$ 4,576,368	$ 12,368,520	-	-	-	$ 32,648,100
65-69	4	3	66	63	71	248	93	-	-	548
	$ 116,439	$ 115,667	$ 2,522,955	$ 2,788,922	$ 3,356,219	$ 14,090,954	$ 7,408,887	-	-	$ 30,400,043
	$ 36,600	$ 30,000	$ 943,020	$ 1,194,096	$ 1,486,968	$ 6,491,904	$ 3,418,560	-	-	$ 13,601,148
70+	-	2	4	1	3	86	112	47	7	262
	-	$ 135,271	$ 88,620	$ 21,546	$ 153,035	$ 3,862,132	$ -	$ -	$ 689,803	$ 4,950,407
	-	$ 101,544	$ 15,924	$ 4,092	$ 25,164	$ 1,274,328	$ 2,696,928	$ 1,461,312	$ 257,496	$ 5,836,788
TOTAL	414	327	298	226	240	689	209	47	7	2,457
	$ 12,869,903	$ 18,772,462	$ 15,919,783	$ 11,830,716	$ 13,455,328	$ 41,079,977	$ 7,408,887	$ -	$ 689,803	$ 122,026,859
	$ 13,316,940	$ 11,035,068	$ 9,324,012	$ 6,898,392	$ 7,677,480	$ 20,916,540	$ 6,115,488	$ 1,461,312	$ 257,496	$ 77,002,728

AVERAGES

Attained Age	63.38
Service Years	4.68
Annual Salary	$49,665
Yearly Benefit	$31,340

TRSL MEMBERSHIP PROFILE
Regular Retirees

CELLS DEPICT **Member Count**
Total Benefits

Valuation Date **6/30/2017**

Age/Years Retired	<1	1	2	3	4	5-9	10-14	15-19	20+	TOTAL
<40	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
40-44	36	20	7	1	1	-	-	-	-	65
	$ 819,444	$ 430,284	$ 156,072	$ 7,740	$ 13,248	-	-	-	-	$ 1,426,788
45-49	90	85	84	84	85	70	1	-	-	499
	$ 2,303,940	$ 1,846,884	$ 1,933,872	$ 1,780,716	$ 1,886,136	$ 1,433,664	$ 11,880	-	-	$ 11,197,092
50-54	158	127	119	119	161	309	105	-	1	1,099
	$ 5,114,988	$ 3,859,788	$ 3,431,628	$ 2,963,700	$ 3,812,256	$ 6,769,524	$ 1,645,284	$ -	$ 1,416	$ 27,598,584
55-59	578	581	537	488	457	586	407	148	5	3,787
	$ 21,314,844	$ 21,328,752	$ 19,639,524	$ 17,599,932	$ 15,855,060	$ 16,552,620	$ 7,088,016	$ 1,909,044	$ 25,224	$ 121,313,016
60-64	823	887	924	1,149	1,228	3,683	1,221	671	274	10,860
	$ 20,972,304	$ 25,011,708	$ 28,076,628	$ 37,087,164	$ 41,840,808	$ 126,255,252	$ 27,012,216	$ 9,474,756	$ 3,106,536	$ 318,837,372
65-69	466	613	737	883	1,191	4,815	4,952	1,039	1,005	15,701
	$ 12,301,344	$ 16,950,756	$ 19,975,872	$ 24,409,212	$ 34,964,580	$ 140,895,792	$ 154,027,332	$ 20,495,844	$ 13,320,936	$ 437,341,668
70-74	130	163	224	293	388	2,549	4,693	3,018	1,470	12,928
	$ 3,727,116	$ 4,805,484	$ 7,037,508	$ 8,798,964	$ 11,356,596	$ 70,843,608	$ 125,181,156	$ 84,117,108	$ 24,061,368	$ 339,928,908
75-79	41	47	69	72	91	720	2,131	3,109	2,883	9,163
	$ 1,199,736	$ 1,654,836	$ 2,117,556	$ 2,499,480	$ 2,676,600	$ 21,648,516	$ 53,019,420	$ 75,762,804	$ 68,261,364	$ 228,840,312
80-84	20	7	16	16	19	157	592	1,393	4,006	6,226
	$ 287,664	$ 324,516	$ 304,260	$ 406,860	$ 599,184	$ 5,422,164	$ 15,806,124	$ 32,213,184	$ 92,346,504	$ 147,710,460
85-89	7	1	4	5	4	47	112	320	3,109	3,609
	$ 137,628	$ 13,740	$ 219,804	$ 77,112	$ 101,748	$ 1,977,012	$ 3,245,244	$ 8,680,560	$ 64,282,308	$ 78,735,156
90+	4	-	-	-	3	5	18	48	1,734	1,812
	$ 84,084	-	-	-	$ 77,268	$ 146,256	$ 446,076	$ 1,212,828	$ 30,586,548	$ 32,553,060
TOTAL	2,353	2,531	2,721	3,110	3,628	12,941	14,232	9,746	14,487	65,749
	$ 68,263,092	$ 76,226,748	$ 82,892,724	$ 95,630,880	$ 113,183,484	$ 391,944,408	$ 387,482,748	$ 233,866,128	$ 295,992,204	$ 1,745,482,416

AVERAGES		
	Attained Age	71.27
	Years Retired	13.08
	Yearly Benefit	$26,548

TRSL MEMBERSHIP PROFILE
Disability Retirees

CELLS DEPICT **Member Count**
Total Benefits

Valuation Date **6/30/2017**

Age/Years Retired	<1	1	2	3	4	5-9	10-14	15-19	20+	TOTAL
<40	9	15	9	4	1	5	-	-	-	43
	$ 156,972	$ 223,584	$ 147,972	$ 73,092	$ 16,752	$ 70,908	-	-	-	$ 689,280
40-44	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
50-54	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
60-64	150	176	144	134	148	451	348	225	152	1,928
	$ 2,491,296	$ 3,118,332	$ 2,646,300	$ 2,296,584	$ 2,570,112	$ 6,767,124	$ 4,229,688	$ 2,397,576	$ 1,589,424	$ 28,106,436
65-69	7	10	17	11	23	160	224	151	230	833
	$ 100,560	$ 132,516	$ 251,844	$ 179,232	$ 290,064	$ 2,225,928	$ 2,641,152	$ 1,595,040	$ 2,800,956	$ 10,217,292
70-74	3	3	6	1	2	32	144	179	266	636
	$ 43,272	$ 46,632	$ 108,324	$ 11,016	$ 18,756	$ 419,292	$ 1,683,444	$ 1,823,592	$ 2,938,404	$ 7,092,732
75-79	1	-	-	1	-	4	22	104	323	455
	$ 10,428	-	-	$ 11,484	-	$ 64,284	$ 260,472	$ 1,021,104	$ 3,241,128	$ 4,608,900
80-84	-	-	-	-	-	-	7	20	218	245
	-	-	-	-	-	-	$ 58,668	$ 193,704	$ 2,258,364	$ 2,510,736
85-89	-	-	-	-	-	-	1	3	97	101
	-	-	-	-	-	-	$ 8,928	$ 18,516	$ 966,564	$ 994,008
90+	-	-	-	-	-	-	-	-	39	39
	-	-	-	-	-	-	-	-	$ 385,104	$ 385,104
TOTAL	170	204	176	151	174	652	746	682	1,325	4,280
	$ 2,802,528	$ 3,521,064	$ 3,154,440	$ 2,571,408	$ 2,895,684	$ 9,547,536	$ 8,882,352	$ 7,049,532	$ 14,179,944	$ 54,604,488

AVERAGES

Attained Age	65.77
Years Retired	15.04
Yearly Benefit	$12,758

TRSL MEMBERSHIP PROFILE
Survivor Benefits

CELLS DEPICT **Member Count**
Total Benefits

Valuation Date **6/30/2017**

Age/Years Retired	<1	1	2	3	4	5-9	10-14	15-19	20+	TOTAL
<40	41	41	44	39	50	112	54	24	7	412
	$ 648,000	$ 464,592	$ 587,244	$ 556,320	$ 666,720	$ 1,264,572	$ 589,356	$ 175,440	$ 100,896	$ 5,053,140
40-44	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
50-54	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
60-64	104	119	106	119	90	397	269	180	146	1,530
	$ 2,000,724	$ 1,979,760	$ 2,063,628	$ 2,273,748	$ 1,666,380	$ 6,379,404	$ 4,029,396	$ 2,270,544	$ 1,796,472	24,460,056
65-69	63	66	52	59	61	233	147	106	107	894
	$ 1,694,760	$ 1,925,592	$ 1,135,068	$ 1,630,836	$ 1,497,708	$ 5,568,564	$ 3,155,820	$ 1,893,048	$ 1,504,356	20,005,752
70-74	76	60	74	67	64	224	164	127	165	1,021
	$ 1,938,240	$ 1,789,320	$ 1,670,556	$ 1,762,032	$ 1,396,092	$ 5,173,380	$ 3,680,928	$ 2,480,844	$ 2,535,984	22,427,376
75-79	81	88	73	63	60	250	190	132	235	1,172
	$ 2,120,916	$ 2,056,140	$ 1,882,404	$ 1,614,660	$ 1,463,400	$ 5,863,608	$ 4,072,740	$ 2,879,124	$ 4,144,404	26,097,396
80-84	72	71	63	60	47	208	178	136	247	1,082
	$ 1,679,076	$ 1,420,884	$ 1,506,624	$ 1,454,352	$ 1,025,556	$ 4,442,736	$ 3,596,076	$ 2,868,696	$ 4,172,208	22,166,208
85-89	35	43	38	33	38	167	104	87	165	710
	$ 783,840	$ 849,216	$ 875,112	$ 550,752	$ 737,448	$ 2,883,468	$ 2,030,628	$ 1,512,864	$ 2,943,396	13,166,724
90+	11	14	19	20	23	65	71	53	132	408
	$ 125,064	$ 233,340	$ 292,944	$ 275,436	$ 333,540	$ 1,031,208	$ 1,064,844	$ 767,376	$ 2,073,900	6,197,652
TOTAL	483	502	469	460	433	1,656	1,177	845	1,204	7,229
	$ 10,990,620	10,718,844	10,013,580	10,118,136	8,786,844	32,606,940	22,219,788	14,847,936	19,271,616	$ 139,574,304

AVERAGES		
	Attained Age	70.70
	Years Retired	11.09
	Yearly Benefit	$19,308

TRSL MEMBERSHIP PROFILE
Vested Terminations

CELLS DEPICT **Member Count**
Total Benefit

Valuation Date **6/30/2017**

Age/Service	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	TOTAL
<20	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
20-24	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
25-29	-	-	32	-	-	-	-	-	-	32
	-	-	$ 182,446	-	-	-	-	-	-	$ 182,446
30-34	-	-	611	23	-	-	-	-	-	634
	-	-	$ 4,559,448	$ 307,029	-	-	-	-	-	$ 4,866,478
35-39	-	2	814	236	10	-	-	-	-	1,062
	-	$ 8,750	$ 6,412,099	$ 3,336,932	$ 221,290	$ -	-	-	-	$ 9,979,071
40-44	1	4	699	308	94	4	-	-	-	1,110
	$ 537	$ 10,530	$ 5,243,676	$ 4,418,556	$ 1,850,926	$ 73,403	-	-	-	$ 11,597,629
45-49	-	4	751	363	114	15	2	-	-	1,249
	-	$ 13,474	$ 5,063,362	$ 4,452,898	$ 2,119,063	$ 365,773	$ 123,731	-	-	$ 12,138,301
50-54	-	6	616	345	131	26	7	-	-	1,131
	-	$ 16,416	$ 4,093,897	$ 3,936,407	$ 2,035,870	$ 641,886	$ 242,441	-	-	$ 10,966,917
55-59	-	4	560	421	160	23	6	2	-	1,176
	-	$ 7,790	$ 3,662,651	$ 4,443,511	$ 2,284,704	$ 514,446	$ 163,887	$ 107,862	-	$ 11,184,850
60-64	1	3	188	104	47	13	7	-	-	363
	$ 388	$ 6,303	$ 1,148,265	$ 991,683	$ 701,081	$ 305,507	$ 162,473	-	-	$ 3,315,700
65-69	-	4	68	26	8	4	3	-	-	113
	-	$ 7,756	$ 393,711	$ 246,901	$ 120,962	$ 105,684	$ 54,110	-	-	$ 929,123
70+	-	-	28	18	9	7	3	3	3	71
	-	-	$ 137,076	$ 97,704	$ 72,804	$ 206,984	$ 78,385	$ 70,036	$ 131,043	$ 794,033
TOTAL	2	27	4,367	1,844	573	92	28	5	3	6,941
	$ 925	$ 71,018	$ 30,896,631	$ 22,231,621	$ 9,406,700	$ 2,213,683	$ 825,027	$ 177,898	$ 131,043	$ 65,954,547

AVERAGES

Attained Age	47.63
Service Years	9.51
Yearly Benefit	$9,502

3. Plan Provisions

A. SUMMARY OF PLAN PROVISIONS

EFFECTIVE DATE:

August 1, 1936

EMPLOYER:

The State of Louisiana, the parish school board, the city school board, the State Board of Education, the State Board of Supervisors, University or any other agency of and within the State by which a teacher is paid.

ELIGIBILITY FOR PARTICIPATION:

In general, with few exceptions, all teachers shall become members of this system as a condition of their employment R.S. 11:721.

SERVICE:

Service as a "Teacher", within the meaning of paragraph R.S. 11:701(33).

CREDITABLE SERVICE:

"Prior Service" plus "Membership Service" for which credit is allowable. "Prior Service" means allowable service rendered prior to the date of establishment of the retirement system and "Membership Service" means service as a teacher rendered while a member of the retirement system.

ADDITIONAL CREDITABLE SERVICE:

1. Credit for service canceled by withdrawal of accumulated contributions may be restored by a member by paying the amount withdrawn plus interest.

2. Service rendered in the public school system of another state may be purchased at the actuarial cost of the additional retirement benefit, or at the member's option receive service credit based on the funds actually transferred.

3. Credit for service in non-public or parochial schools may be purchased at the actuarial cost of the additional retirement benefit, or at the member's option receive service credit based on the funds actually transferred.

4. Maximum of 4 years of credit for military service may be obtained for each member, contingent on payment of actuarial cost.

5. Credit for legislative service of a former teacher, who is now a legislator, may be purchased at the actuarial cost.

6. Conversion of Sick Leave to Membership Service: At retirement, or at death before retirement of member with surviving spouse or dependent or both who are entitled to benefits, unused accumulated sick leave will be added to membership service. Conversion of unused sick and annual leave cannot be used to obtain retirement eligibility. Leave accumulated after January 30, 1990, can be converted to a maximum one year service credit. Leave is converted on the following basis:

Leave Earned Prior to 6/30/88	
Accumulated Sick Days	Fraction of Year Credit
25-45	0.25 year
46-90	0.50 year
91-135	0.75 year
136-180	1.00 year
181-225	1.25 years
226-270	1.50 years
271-315	1.75 years
316-360	2.00 years

Leave Earned After 6/29/88				
Accumulated Sick Days (by Member Classification)				Fraction of Year Credit
9 Month	10 Month	11 Month	12 Month	
10-18	11-20	12-22	13-24	0.1
19-36	21-40	23-44	25-48	0.2
37-54	41-60	45-66	49-72	0.3
55-72	61-80	67-88	73-96	0.4
73-90	81-100	89-110	97-120	0.5
91-108	101-120	111-132	121-144	0.6
109-126	121-140	133-154	145-168	0.7
127-144	141-160	155-176	169-192	0.8
145-162	161-180	177-198	193-216	0.9
163-180	181-200	199-220	217-240	1

EARNABLE COMPENSATION:

The compensation earned by a member for qualifying service.

FINAL AVERAGE COMPENSATION

For members whose first employment makes them eligible for membership in a Louisiana state retirement system on or after January 1, 2011, the average annual earnable compensation is the highest 60 successive months of employment. The average compensation for purposes of computing benefits cannot increase more than 15% per year.

For all other members, the average annual earnable compensation is the highest 36 successive months of employment; the average compensation for purposes of computing benefits cannot increase more than 10% per year.

Per R.S.11:892, if the maximum benefit accrual (100%) is reached, employee contributions are discontinued, average final compensation is not limited to the years for which employee contributions were made. Compensation is limited by the Internal Revenue Code Section 401(a)(17) compensation limit.

Includes workmen's compensation, and PIP's program in accordance with the following:

Years of Participation	% of Earnings to Be Included
3	60%
4	80%
5	100%

However, if member completed at least two years and subsequently becomes disabled, he shall receive 40% of such earnings. If he has completed one year and becomes disabled, he shall receive 20% of such earnings.

ACCUMULATED CONTRIBUTIONS:

Sum of all amounts deducted from compensation of members.

EMPLOYEE CONTRIBUTIONS:

8% of earnable compensation. Prior to July 1, 1989, 7% of earnable compensation.

EMPLOYER CONTRIBUTIONS:

Determined in accordance with Title 11 of Louisiana Revised Statutes Sections 102 and 102.2, which require the employer rate to be actuarially determined and set annually, based on the Public Retirement Systems' Actuarial Committee's recommendation to the Legislature.

NORMAL RETIREMENT BENEFIT:

Eligibility and Benefit:

After submitting written application to the Board, members are eligible for the following:

1. Members whose first employment making them eligible for membership in a Louisiana state retirement system on or after July 1, 2015, may retire with a 2.5% accrual rate after attaining age 62 with at least 5 years of service credit. Members are eligible for an actuarially reduced benefit with 20 years of service at any age.

2. Members whose first employment makes them eligible for membership in a Louisiana state retirement system on or after January 1, 2011, and before July 1, 2015, may retire with a 2.5% accrual rate after attaining age 60 with at least 5 years of service credit. Members are eligible for an actuarially reduced benefit with 20 years of service at any age.

3. For all other members:

   If hired on or after July 1, 1999, members are eligible for a 2.5% accrual rate at the earliest of age 60 with 5 years of service, age 55 with 25 years of service, or at any age with 30 years of service. Members may retire with an actuarially reduced benefit with 20 years of service at any age.

   If hired before July 1, 1999, members are eligible for a 2% accrual rate at the earliest of age 60 with 5 years of service, or at any age with 20 years of service and are eligible for a 2.5% accrual rate at the earliest of age 65 with 20 years of service, age 55 with 25 years of service, or at any age with 30 years of service.

Benefit:

Annuity, which shall be the actuarial equivalent of accumulated employee contributions at retirement date, and Annual pension, which, together with annuity, provides total allowance equal to the applicable accrual rate times final average compensation times years of creditable service (including unused sick leave). Members hired before June 30, 1986, receive an additional $300 annual supplemental benefit (Act 608 of 1986).

A. Annual benefit may not exceed 100% of average earnable compensation.

B. Legislator's benefit is calculated based on either Teacher's or Legislator's salary but not both- for new legislators (their option to choose); employee contribution to be 12% of either salary or expense allowance as legislator, not both.

C. For Members employed on or after July 1, 1999, the annual pension cannot exceed the maximum benefit provided under Section 415(b) of the Internal Revenue Service Code and related Federal Regulations as adjusted for inflation and form of benefit other than life annuity or qualified joint and survivor annuity.

DISABILITY RETIREMENT:

Eligibility:

Members whose first employment makes them eligible for membership in a Louisiana state retirement system on or after January 1, 2011, are eligible with 10 years of service credit. All other members are eligible with 5 years of service; certification of disability by medical board (medical examination required once in every year for the first 5 years of disability retirement, and once in every 3 years thereafter, until age 60).

Benefit: Act 572 of 1995

(1) If ineligible for service retirement at disability, disability pension will be 2.5% of average compensation multiplied by years of service. Benefit is limited to 50% of average compensation, but will not be less than the lesser of 40% of the state minimum salary for a beginning teacher with a bachelor's degree or 75% of average compensation.

(2) Additional 50% of member's benefit payable if minor child is present, but total amount to family limited to 75% of final average compensation.

(3) Member will become a regular retiree upon attainment of the earliest age for retirement eligibility as if the member continued in service, without further change in compensation. Benefit is based on years of creditable service but not less than the disability benefit. Benefit for minor children continue as long as the retiree has a minor child.

(4) Upon death of a disability retiree, surviving spouse, married to retiree at least two years prior to death of the disability retiree, shall receive 75% of disability benefit. Upon death of an unmarried retiree with minor children, the benefit shall equal 50% of disability benefit.

(5) Upon recovery of disability as determined by the board of trustees, upon advice of the medical board, and returns to active membership for at least three years starting no later than one year after recovery, then he shall be credited with one year of service for each year disabled for purposes of establishing benefit eligibility, but not for computation of benefits.

SURVIVOR'S BENEFITS (Effective July 13, 1978):

Eligibility and Benefit:

1. Surviving Spouse with minor children of an active member with 5 years of creditable service with at least 2 years earned immediately prior to death; or a member with 20 years of creditable service regardless of when earned or whether in active service at time of death will receive:

The greater of:

A.) $600 per month, or

B.) 50% of benefit that would have been payable upon service retirement at age 60 had member continued in service to age 60 without change in compensation. 50% of spouse's benefit payable for each minor child (not greater than two), with total benefit to family at least equal to the Option 2, accrued Benefit based on actual service credit. Benefits to spouse cease upon remarriage, but resumes upon subsequent divorce or death of new spouse; however, if the member was eligible to retire or had reached age 55 on the date of his death, benefits shall not cease upon remarriage. When minor children are no longer present, spouse's benefit reverts to benefit in B, for eligible spouse. If a deceased member had less than 10 years, then the spouse will receive a refund of any remaining member contributions and monthly survivor benefits will cease.

2. Surviving Spouse without minor children of either an active member with 10 years of creditable service with at least 2 years earned immediately prior to death, or a member with 20 years of creditable service regardless of when earned or whether in active service at time of death will receive:

   The greater of:

   A.) $600 per month, or

   B.) Option 2 equivalent of accrued benefit based on actual service. Spouse's benefit is payable for life. Benefits to spouse cease upon remarriage, but resumes upon subsequent divorce or death of new spouse; however, if the member was eligible to retire on the date of his death, benefits shall not cease upon remarriage.

3. Beneficiary not eligible for 1 or 2 will receive return of member's accumulated contributions.

OPTIONAL FORMS OF BENEFIT:

In lieu of receiving a normal retirement benefit, members may elect to receive an actuarial equivalent retirement allowance in a reduced form as follows:

Option 1 If a member dies before receiving present value of annuity in monthly payments, balance paid to designated beneficiary.

Option 2 Reduced retirement allowance, if member dies, to be continued to designated beneficiary for his lifetime.

Option 3 One-half of reduced retirement allowance, if member dies, to be continued to designated beneficiary for his lifetime.

Option 4 Other benefits of equal actuarial value may be elected with approval of board.

Options 2A, 3A, 4A

Same as Options 2, 3, and 4, except that reduced benefit reverts back to maximum if beneficiary predeceases retiree.

Automatic COLA Option

Members may choose an irrevocable election at retirement to receive an actuarially reduced benefit which increases 2.5% annually. The increase begins on the first retirement anniversary date, but not before the retiree attains age 55 or would have attained age 55 in the case of a surviving spouse. This option can be chosen in combination with the above options. (Per Act 270 of 2009, effective July 1, 2009)

Initial Lump Sum Benefit Option

Members who did not participate in DROP may elect an actuarially reduced pension and receive a lump-sum equal to not more than 36 months of the maximum monthly pension.

REFUND OF CONTRIBUTIONS:

Death prior to retirement - accumulated contributions credited to individual account in annuity savings fund are returnable to designated beneficiary, if any; otherwise, to his estate.

TERMINATION WITH VESTED SERVICE:

Any member with credit for 5 years of service who withdraws from service may elect to leave accumulated contributions in system until age 60, when he may apply for retirement and begin receiving a retirement benefit based on the credits he had at date of withdrawal.

DEFERRED RETIREMENT OPTION PLAN:

Instead of terminating employees and accepting a service retirement allowance, any member who has met the eligibility requirements may elect to participate in the Deferred Retirement Option Plan (DROP) and defer receipt of benefits.

Normal Eligibility:

DROP Eligibility by Plan		
Plan	**Benefit Factor**	**Eligibility Criteria**
Membership prior to January 1, 2011		
Regular Plan	2.50%	Any age with 30 years of eligibility credit; or At least age 55 with 25 years of eligibility credit
	2.00%	At least age 60 with 10 years of eligibility credit
Lunch Plan A	3.00%	Any age with 30 years of eligibility credit; or At least age 55 with 25 years of eligibility credit; or At least age 60 with 10 years of eligibility credit
Lunch Plan B	2.00%	At least age 55 with 30 years of eligibility credit; or At least age 60 with 10 years of eligibility credit
Membership between January 1, 2011, and June 30, 2015		
Regular Plan	2.50%	At least age 60 with 5 years of eligibility credit
Lunch Plan B	2.00%	At least age 55 with 30 years of eligibility credit; or At least age 60 with 10 years of eligibility credit
Membership on or after July 1, 2015		
Regular Plan	2.50%	At least age 62 with 5 years of eligibility credit
Lunch Plan B	2.00%	At least age 62 with 5 years of eligibility credit

Benefit:

Upon termination of employment, a participant will receive, at his option:

(1) Lump sum payment (equal to the payments to the account);
(2) A true annuity based upon his account; or
(3) Other methods of payment approved by the board of trustees.

If a participant dies during the period of participation in the program, his account balance shall be paid to the beneficiary, or if none, to his estate in any form approved by the Board of Trustees.

If employment is not terminated at the end of DROP participation, payments into the account ceases and account earns interest. The participant resumes active contributing membership and earns an additional retirement benefit based on additional service rendered. The method of computation of the additional benefit is subject to the following:

(1) If additional service was less than the period used to determine Final Average Compensation, average compensation figure to calculate the additional benefit will be the same as used to calculate initial benefit.

(2) If additional service was earned for a period greater than the number of months used to determine Final Average Compensation, the average compensation figure used to calculate the additional benefit will be based on compensation during the period of additional service.

DROP Accounts established prior to January 1, 2004, earn interest following termination of DROP at a rate 0.5% below the actuarial rate of the System's investment portfolio.

DROP accounts established on or after January 1, 2004 are credited with Money Market rates.

B. DESCRIPTION OF BENEFITS FOR MERGED LSU EMPLOYEES

GENERAL:

Eligibility for benefits based on the eligibility requirements of the Teachers' plan, except for deaths and disabilities before 1984. All service, funded and non-funded, is used in determining eligibility.

Final Average Salary was the average of the three highest years, except for academic year employees who retired within three years after January 1, 1979. For this group, any salary used in the Final Average Salary calculation, which was earned before January 1, 1979, was increased by 2/9ths.

The Social Security breakpoint average, for service under the funded LSU plan, was frozen at the December 31, 1978, level. That is, the breakpoint average for funded service was calculated as of December 31, 1978, and kept constant. This produced the following breakpoint averages:

Social Security Breakpoint Average
(for LSU funded service)

Calendar Year of Entry	Breakpoint Average
1971 or before	13,400
1972	13,800
1973	14,600
1974	15,360
1975	15,900
1976	16,500
1977	17,100
1978	17,700

RETIREMENT BENEFITS:

Retirement benefits calculated using LSU funded service with the LSU formula and service after December 31, 1978, with the Teacher's formula. Thus, the "funded" benefit is (1) 1.33% of final average salary under the Social Security breakpoint average plus 2.5% of final average salary over the Social Security breakpoint average, times years of "funded" service with LSU before December 31, 1978, plus (2) 2.5% (or 2% if total service less is than 20 years) times final average salary times years since January 1, 1979, plus $300.

SURVIVOR'S BENEFITS:

For deaths after 1983, the provisions of the Teachers' plan apply. However, the benefit is calculated using all service, funded and non-funded, then prorated by service between the funded and non-funded portions. Children's benefits are also prorated into the funded and non-funded portions.

DISABILITY BENEFITS:

For disabilities after 1983, the provisions of the Teachers' plan apply. However, the benefit is calculated using all service, then prorating by service between the funded and non-funded portions. Children's benefits are also prorated.

VESTING BENEFITS:

Benefits for terminated vested members are determined as outlined under "Retirement Benefits."

REFUND OF CONTRIBUTIONS:

Terminated members are allowed a refund of accumulated contributions as described by the Teachers' plan.

COOPERATIVE EXTENSION PERSONNEL:

The LSU employees are eligible for the supplemental benefit described in Section 700.2 of Act 643 of 1978. The benefit is equal to 1% for the first five years of service, 3/4% for the next five years, and 1/2% thereafter. The funded benefit is the benefit based on service after September 12, 1975.

OPTIONAL FORMS OF BENEFITS:

Retiring members may elect options as described by the Teachers' plan.

DEFERRED RETIREMENT OPTION PLAN:

Eligible members may participate under same requirements as described by the Teachers' plan.

C. DESCRIPTION OF BENEFITS FOR MERGED SCHOOL LUNCH EMPLOYEES

EFFECTIVE DATE:

The School Lunch Employees' Retirement System was originally established on January 1, 1953.

On July 1, 1980, the School Lunch Employees' Retirement System was restructured. All individuals who become employed after July 1, 1980, shall become members of Plan A or Plan B as determined by the agreement in effect for each employer.

Plan A: Parishes which had withdrawn from Social Security coverage became known as Plan A parishes. Those participating in both the regular and the supplemental plan or only in the supplemental plan shall become members of Plan A.

Plan B: Parishes which had not withdrawn from Social Security coverage became known as Plan B parishes. Those participating only in the regular plan shall become members of Plan B.

Effective July 1, 1983, Plan A and Plan B were merged into TRSL.

CREDITABLE SERVICE:

Service as an employee while member of the system.

MILITARY SERVICE:

Maximum of 4 years of credit may be purchased.

ADDITIONAL CREDITABLE SERVICE:

Credit for service canceled by withdrawal of accumulated contributions may be restored by paying into system the amount withdrawn plus regular interest.

EMPLOYEE CONTRIBUTIONS:

Plan A: 9.10% of monthly earnings
Plan B: 5% of monthly earnings

EMPLOYER CONTRIBUTIONS:

Plan A and Plan B: Actuarial Required Amount (Effective July 1, 1989)

D. SCHOOL LUNCH PLAN A

RETIREMENT BENEFIT:

Members hired after June 30, 1983, earn Regular Teachers Benefits. Benefits description below applies to members hired prior to July 1, 1983.

NORMAL RETIREMENT:

Eligibility:

1. Age 60 and 5 years of creditable service.
2. Age 55 and 25 years of creditable service.
3. 30 years of creditable service, regardless of age.

Benefit:

3% of average final compensation times years of creditable service.

Members of only the supplemental plan prior to July 1, 1980, who were age 60 or older at the time the member's employer terminated its agreement with the Department of Health, Education and Welfare, and who became a member of the retirement system because of this termination earned 1% of average final compensation plus $2 per month for each year of service credited prior to July 1, 1980, plus 3% of average final compensation for each year of service credited after July 1, 1980.

*These members are eligible to retire upon reaching age 70, with less than 10 years of creditable service.

Members hired before June 30, 1986, receive an additional $300 annual supplemental benefit.

Benefits are limited to 100% of average final compensation.

DISABILITY RETIREMENT:

Eligibility:

Five years of creditable service; certification of disability by the State Medical Disability Board.

Benefit:

Normal retirement allowance if eligible; otherwise, an amount equal to the normal retirement allowance to which the member would have been entitled had he met eligibility requirements; provided the amount is subject to a minimum of 60% and a maximum of 100% of average final compensation, in the event no optional selection is chosen.

SURVIVOR'S BENEFITS:

Eligibility:

1. Surviving spouse with minor children of a member with 5 years of service credit with at least 2 years earned immediately prior to death, or 20 years of service credit regardless of when earned or whether the deceased member was in active service at the time of death.

2. Surviving spouse with no minor children of member with 10 or more years of service credit with at least 2 years earned immediately prior to death, or 20 years of service credit regardless of when earned or whether the deceased member was in active service at the time of death.

3. Beneficiary not eligible for 1 or 2.

Benefit:

1. Greater of:

   A. $600 per month, or

   B. 50% of benefit that would have been payable upon retirement at age 60 had member continued in service to age 60 without change in compensation. 50% of spouse's benefit payable for each minor child (maximum two children), with total benefit to family at least equal to the Option 2 benefit. Accrued Benefit based on actual service credit. Benefits to spouse cease upon remarriage, but will resume upon subsequent death or divorce. When minor children are no longer present, spouse's benefit reverts to benefit in (2), if spouse is eligible for such benefit.

2. Greater of:

   A. $600 per month, or

B. Option 2 equivalent of accrued benefit based on actual service. Surviving spouse must have been married to the deceased member at least one year prior to death. If the member had not been eligible for retirement upon date of death, benefits to spouse cease upon remarriage, but resume upon subsequent death or divorce of new spouse.

3. Return of member's accumulated contributions.

E. SCHOOL LUNCH PLAN B

NORMAL RETIREMENT:

Eligibility:

1. Age 60 and 5 years of creditable service.

2. Age 55 and 30 years of creditable service.

Benefit:

Annual pension which provides total allowance equal to 2% of average final compensation times years of creditable service. Members hired before June 30, 1986, receive an additional $300 annual supplemental benefit.

NOTE:

Benefit reduced by 3% for each year under age 62, unless member has 25 years of creditable service.

DISABILITY RETIREMENT:

Eligibility:

Five years of creditable service; certification of disability by the State Medical Disability Board.

Benefit:

Normal retirement allowance if eligible; otherwise 2% of average final compensation times years of creditable service; provided amount not less than 30%, nor more than 75% of average final compensation, in the event no optional selection is made.

SURVIVOR'S BENEFITS:

Eligibility: Twenty or more years of creditable service.

Benefit: Option 2 benefit.

F. SCHOOL LUNCH PLAN A and PLAN B

OPTIONAL FORMS OF BENEFIT:

Retiring members may elect options as described by the Teachers' plan.

RETURN OF CONTRIBUTIONS:

Should a member not eligible to retire cease to be an employee, he shall be paid the amount of his accumulated contributions upon demand. Should a members death occur prior to retirement with no survivors eligible for benefits, his accumulated contributions are returnable to a designated beneficiary, if any; otherwise, to his estate.

TERMINATION WITH VESTED SERVICE:

Any member with credit for 5 years of service who withdraws from service may elect to leave accumulated contributions in system until his earliest normal retirement date, when he may apply for retirement and begin receiving a retirement benefit based on average final compensation and creditable service at date of withdrawal.

DEFERRED RETIREMENT OPTION PLAN:

Retiring members may elect options as described by the Teachers' plan.

4. Funding Policies

TRSL's funding policy is generally described in Sections 102 and 102.2 of Title 11 of Louisiana Revised Statutes. TRSL is funded from employee and employer contributions using the Entry Age Normal funding method. The total contribution requirement consists of the normal cost (the value of benefits earned by current active employees allocated to the current year) and the amortization cost (amortization payments necessary to liquidate the unfunded accrued liability). The total contribution percentage is determined as the total contribution requirement divided by the payroll applicable to active members. Employee contribution requirements are set forth in R.S. 11:62. The employer contribution rate is equal to the total contribution rate minus the employee rate.

Employer contribution requirements are determined one year in advance of the fiscal year for which the requirement is used. Differences between projected contributions and actual contributions are defined as a contribution variance. The contribution process is defined below:

A. **Projected Employer Dollar Contribution for FYE 2017** − The June 30, 2015, valuation established the projected employer contribution rate for FYE 2017. The projected dollar contribution for FYE 2017 is equal to the projected employer contribution rate, multiplied by the projected active member payroll for FYE 2017.

B. **Actual Employer Dollar Contribution for FYE 2017** – Actual dollar contributions for FYE 2017 are obtained from system financial statements.

C. **Contribution Variance** – The difference between the Actual Dollar Contribution for FYE 2018 and the Projected Dollar Contribution for FYE 2017, adjusted for investment earnings, is equal to the Contribution Variance. A positive variance means that a contribution surplus occurred for FYE 2017. A negative variance indicates a contribution shortfall or deficit.

D. Actuarially Determined Employer Contribution Rate for FYE 2018 – The actuarially determined contribution rate for FYE 2018 is determined by the June 30, 2017, valuation. The normal cost rate for FYE 2018 is equal to the dollar normal cost for FYE 2018 divided by the projected payroll for FYE 2018. The amortization cost rate for FYE 2018 is equal to the sum of all amortization payments for FYE 2018 divided by the projected payroll for FYE 2018. The total contribution rate is the sum of the normal cost rate and the amortization cost rate.

E. Actuarially Determined Employer Dollar Contribution for FYE 2018 – The actuarially determined employer dollar contribution for FYE 2018 is determined by the June 30, 2017 actuarial valuation and is equal to the actuarially determined employer contribution rate for FYE 2018 multiplied by the projected payroll for FYE 2018.

F. **Projected Employer Contribution Rate for FYE 2019** − The June 30, 2017 valuation establishes the projected employer contribution rate for FYE 2019 The rate is equal to the projected employer dollar contribution for FYE 2019 divided by the projected active member payroll for FYE 2019.

G. **Projected Employer Dollar Contribution for FYE 2019** − The June 30, 2017, valuation establishes the projected employer contribution for FYE 2019. It is equal to the projected employer contribution rate multiplied by the projected active member payroll for FYE 2019.

From time to time, additional funding is provided directly by the state out of non-recurring revenue in accordance with Article VII, Section 10(D)(2)(b)(ii). This provision of the Constitution requires such funds to be used to reduce the Original Amortization Base (OAB) which includes the Initial Unfunded Accrued Liability (IUAL). These amounts have been about 1% of the total contribution paid to the retirement system annually since the inception of this constitutional provision in 2014.

According to Article X(29)(E)(2)(a) of the Louisiana Constitution, the minimum employer contribution that may be made to TRSL is equal to 11.0% and 11.7% depending on whether the employee was hired on or before June 30, 2011, or on or after July 1, 2011, respectively. The legislature established a larger minimum employer contribution rate in the 2004 session. This legislative minimum is 15.5% of pay. Any amount made in excess of the legislative minimum will be deposited and accumulated in the Employer Credit Account. Amounts in the Employer Credit Account may be used only to reduce any UAL established before July 1, 2004.

5. Actuarial Methods

Cost Method:

The Entry Age Normal (EAN) funding method is the method required under R.S. 11:22 of Louisiana law to produce annual employer contribution requirements. This EAN method generally produces normal costs that are level as a percentage of salary through an individual's working career. The EAN method produces an unfunded accrued liability that changes annually. Various methods were used prior to June 30, 2015, to amortize new credits or debits to the unfunded accrued liability. Unfunded accrued liability charges or credits established on June 30, 2015, or later years, will be amortized in the following manner:

A. Increases or decreases resulting from changes in benefit provisions are amortized with level payments over 10 years.

B. Increase or decreases resulting from decrement gains and losses are amortized with level payments over 30 years.

C. Increases or decreases resulting from changes in actuarial assumptions and methods are amortized with level payments over a 30-year period.

D. Contribution actually made for a given fiscal year will be more or less than the amount actually required. Contribution deficits will be amortized with level payments over a 5-year period. Contribution surpluses will be used to reduce the EAAB through FYE 2040 (i.e., immediate amortization). Thereafter, surpluses will be amortized with level payments over 5 years.

E. Increases resulting from actual contributions being less than the actual dollar required contribution are amortized with level payments over 5 years. Decreases resulting from actual contributions being greater than the dollar contribution requirement are used to reduce the EAAB through FYE 2040 (i.e., immediate amortization). Decreases thereafter will be amortized with level payments over a 5-year period.

F. Amortization rules pertaining to investment gains and losses are summarized below:

1. Investment losses are amortized with level payments over a 30-year period. Once the system becomes 85% funded, investment gains will be amortized over a 20-year period.

2. Investment gains up to the first investment hurdle ($100 million) are used to reduce the outstanding balance of the OAB. However, the OAB payment schedule will remain the same and the OAB will be paid off sooner than it would otherwise.

3. Investment gains between the first hurdle ($100 million) and the second hurdle ($200 million) are used to reduce the outstanding balance of the Experience Account Amortization Base (EAAB). However, the EAAB payment schedule will remain the same and the EAAB will be paid off sooner than it would otherwise.

4. Investment gains exceeding the second hurdle, net of transfer to the Experience Account, will be amortized over 30 years. Once the system becomes 70% funded, investment gains exceeding the second hurdle will be amortized over a 20-year period.

G. Previously, increases in the unfunded accrued liability resulting from investment gains being transferred from the regular pool of assets to the Experience Account were amortized together with all other unexpected decreases or increases in the unfunded accrued liability (also known as the total actuarial gain or loss) over a 30-year period. Beginning with the June 30, 2016 valuation, transfers to the Experience Account are to be amortized over 10-year period leaving the remainder of total actuarial gain or loss to be amortized over a 30-year period as before.

   Ever since TRSL began using an assumed actuarial valuation rate (also known as the discount rate) which is lower than the assumed actuarial rate of return on assets to recognize the expectation of experience account transfers, ambiguities arose in the application of the rules for determining whether a transfer is to occur and how much it would be. These ambiguities should be addressed and resolved in the near future.

These rules comply with actuarial standards of practice. However, the rules are viewed as a not-recommended practice under the CCA PPC white paper because:

A. Some UAL bases have amortization periods that are longer than 25 years.

B. Increases and decreases in UAL produced by the same cause are not always symmetrical.

The Louisiana Legislature has changed amortization periods several times since 1989. The LLA is currently monitoring this type of legislative action and will alert the appropriate legislators and retirement committees if changes are made that would cause the retirement system to fail in its constitutionally mandated requirement to be actuarially sound.

The funding policy described above is consistent with the plan accumulating adequate assets to make benefit payments when due and consistent with improving the funded status of the plan by

fully amortizing the unfunded accrued liability. This retirement system is sustainable as long as actuarially determined contributions are paid when due and all actuarial assumptions are realized.

Asset Valuation Method

The actuarial value of assets is equal to the market value of assets for the current valuation date plus an adjustment to phase in investment gains and losses occurring over the past four years. For June 30, 2017, the preliminary actuarial value is equal to the market value of assets on June 30, 2013, plus 80% of investment gains/losses for FYE 2014, plus 60% of investment gains/losses for FYE 2015, plus 40% of investment gains/losses for FYE 2016, plus 20% of investment gains/losses for FYE 2017.

If the preliminary actuarial value of assets exceeds 120% of the market value on June 30, 2017, then the actuarial value is equal to the average of the preliminary value and 120% of the market value. If the preliminary value is less than 80% of the market value, then the actuarial value is equal to the average of the preliminary value and 80% of the market value. Otherwise, the actuarial value is equal to the preliminary value.

Asset valuation formulas are shown in Section I(5).

Methods for the Experience Account

A detailed analysis of the Experience Account is presented in Section II. The 2010 amendment to the Louisiana Constitution (Article (10)(29)(F)) and discussions with the LLA's General Counsel and with legislative staff have led us to reconsider the treatment of the Experience Account process. We have concluded the following.

1. Laws pertaining to transfers of gains to the Experience Account are still in force.

2. However, laws pertaining to COLAs require additional legislation to implement.

3. Therefore, TRSL still has an obligation under the law to fund the Experience Account as determined by Act 399 of 2014. However, disbursements from the Experience Account will occur only after a bill is introduced by the legislature, passed each house with a two-thirds vote, and signed by the governor. However, because it is likely that disbursement will occur with some regularity, we have assumed that a COLA will be granted and funds will be disbursed every time eligibility conditions are satisfied.

We have prepared our employer contribution requirements for FYE 2019 in accordance with our understanding of the law as summarized above and as summarized in Section II.

Accelerated Reduction of the OAB and EAAB

Specified actuarial gains are used to reduce the outstanding balances of the OAB and the EAAB. These gains include the following special allocations:

1. Specified legislative appropriations reduce the outstanding balance of the OAB.
2. Positive Contribution Variances (or surpluses) reduce the outstanding balance of the EAAB.
3. Investment gains falling between $0 and $100 million reduce the outstanding balance of the OAB.
4. Investment gains falling between $100 million and $200 million reduce the outstanding balance of the EAAB.

However, the amortization payment schedule is unaffected by the reduction in the outstanding balance. Although not identified as such in the law, the end result is that the OAB and the EAAB will each consist of two separate accounts – an Amortization Account and an Offset Account. These accounts operate in the following manner:

1. Amortization payments and outstanding balances in the Amortization Account will be unaffected by the special allocation to the OAB and EAAB cited above. This account will operate as if the special allocations did not exist.
2. The special allocations will be accumulated in the Offset Account. The outstanding balance will grow annually with new special allocations and interest based on the discount rate.
3. The outstanding balance of the OAB on any June 30 will be equal to the outstanding balance of the Amortization Account minus the outstanding balance on the Offset Account.

Eventually, the Offset Account will equal or exceed the Amortization Account and the OAB or EAAB will be fully paid.

Valuation Approval Process

The approval process for annual actuarial valuations for TRSL, as specified in Louisiana law, is summarized below:

1. The TRSL's actuary prepares an actuarial valuation which is presented to the TRSL board of trustees for review and approval.

2. The actuary for the Louisiana Legislative Auditor (LLA) also prepares an actuarial valuation.

3. The actuaries present their valuations to the Public Retirement Systems' Actuarial Committee (PRSAC). PRSAC approves one of the two valuations presented.

4. The valuation approved by PRSAC is then submitted to the House and Senate Committees on Retirement and the Joint Legislative Committee on the Budget.

5. The PRSAC approved valuation receives automatic approval unless one of the legislative committees elects to overturn the PRSAC approval.

Benchmarking

Valuation results were tested by comparing normal costs and liability values produced by our valuation system with values produced by valuation software used by Foster & Foster. Comparisons of values were made for each sub-plan, for each member status category, and for each type of decrement. In aggregate, our accrued liability value as of June 30, 2017 was within 0.01% of the value produced by Foster & Foster. In aggregate, our normal cost value for FYE 2018 was within 0.07% of the value produced by Foster & Foster. Comparisons of values by sub-plan, by status category, and by decrement showed larger deviations, but on the whole produced values acceptable for valuation purposes.

Because of the set of new actuarial assumptions selected by the LLA effective beginning for FYE 2019, accrued liability and normal cost values in our valuation for FYE 2019 are based on our own valuation results.

6. Actuarial Assumptions

Demographic and salary assumptions used in the valuation were adopted by the Board of Trustees following the most recent experience study, effective July 1, 2013. The study was based on an observation period of 2008-2012. The Retirement System is required to conduct an experience study every five years, but the scope of such a study is not necessarily limited to a five year period. The experience was reviewed separately for Regular Teachers, Higher Education, School Lunch Plan A, and School Lunch Plan B. The experience study report, dated March 27, 2013, provides further information regarding the rationale for these assumptions. The current rate tables are illustrated at the end of this exhibit.

Economic Assumption

Assumed Rate of Return on the Actuarial Value of Assets

The assumed rate of return on the actuarial value of assets used for the preparation of actuarially calculated employer contribution requirements for FYE 2018 is 8.20%. The assumed rate of return used to prepare projected employer contribution requirements for FYE 2019 is 6.75%. These rates are net of investment expenses. This 6.75% rate is based on research undertaken by the office of the LLA's actuary.

The Cost of the Gain-Sharing COLA Program

Unfunded actuarial liabilities as of June 30 2017 and contribution rates for FYE 2018 were developed using the same assumptions employed by TRSL and its actuary; specifically, a reduction of the net return assumption of 40 basis points.

For contribution rates for FYE 2019, the treatment of the cost of TRSL's gain-sharing COLA program is based on a wholly updated approach. Please refer to Appendix E – Basis For Treatment of Gain-Sharing Cost-of-Living Benefits for further details.

Assumed Discount Rate

Unfunded actuarial liabilities as of June 30 2017 and contribution rates for FYE 2018 were developed using the same assumptions employed by TRSL and its actuary; specifically, a discount rate of 7.70%.

For contribution rates for FYE 2019, the discount rate used is 6.75%. Please refer to Appendix C – Basis for Economic Assumptions for further details.

Assumed Rate of Inflation

The assumed rate of inflation is a component of salary growth and the assumed rate of return.

Unfunded actuarial liabilities as of June 30 2017 and contribution rates for FYE 2018 were developed using the same assumptions employed by TRSL and its actuary; specifically, an inflation rate of 2.75%.

For contribution rates for FYE 2019, the inflation rate used is 2.25%. Please refer to Appendix C – Basis for Economic Assumptions for further details.

Administrative Expenses

For FYE 2018, administrative costs are estimated to be equivalent to a 10-basis point reduction to the assumed rate of return on the actuarial value of assets.

Effective beginning for FYE 2019, administrative expenses have been accounted for in this valuation by explicitly recognizing them in the normal cost. Please refer to Appendix D – Basis For Treatment of Administrative Expenses for further details.

Mortality Assumption

Unfunded actuarial liabilities as of June 30 2017 and contribution rates for FYE 2018 were developed using the same assumptions employed by TRSL and its actuary.

For contribution rates for FYE 2019, the treatment of the cost of TRSL's gain-sharing COLA program is based on a wholly updated approach. The mortality assumption has been updated to the RP-2014 mortality tables, adjusted by TRSL-derived mortality experience factors, with mortality improvement projected using the MP-2016 improvement scale (published in 2016. Please refer to Appendix B – Basis For Mortality Assumptions for further details.

Disability Assumption

Rates of total and permanent disability, based upon attained age, are projected in accordance with the most recent experience study. Mortality assumptions for disability benefits are based upon the RP-2000 disability mortality table with no projection for mortality improvement.

Retirement/DROP Assumption

Eligibility for normal retirement benefits and participation in DROP is based on age and service requirements that vary by sub-plan. Retirement/DROP decrements differ from one sub-plan to another. These decrements are generally based on the 2008-2012 experience study.

Termination Assumption

Voluntary termination or withdrawal rates are based on the 2008-2012 Experience Study. Rate for Lunch Plan A and Lunch Plan B are based on service. For members hired before July 1, 2015, and terminating with vested benefits, it is assumed that 20% will elect to withdraw their accumulated employee contribution, and 80% will receive a benefit beginning at age 60. For members hired on or after July 1, 2015, and terminating with vested benefits, it is assumed that 20% will elect to withdraw their accumulated employee contribution, and 80% will receive a benefit beginning at age 62.

Salary Growth

The rates of annual salary growth are based upon the member's years of service and are based on the most recent experience study. The rates include anticipated productivity growth, merit adjustments, and an inflation component of 2.50% for FYE 2018 and of 2.25% effective beginning for FYE 2019, which is consistent with the inflation assumptions used to develop the respective discount rates. Please refer to Appendix C – Basis For Economic Assumptions for further details. For valuation purposes, current salaries and projected future salaries are limited to the Section 401(a)17 of the Internal Revenue Service Code 401(a)17 limit, with future indexed increases.

Family Statistics

The composition of the family is based upon Current Population Reports published by the United States Census Bureau. Seventy-five percent of the membership is assumed to be married. The wife is assumed to be three years younger than the husband. Sample rates for the assumed number of minor children are as follows:

Age of Member	Number of Minor Children	Years for Child to Attain Majority
25	1.2	17
30	1.4	15
35	1.7	13
40	1.7	10
45	1.4	8
50	1.1	4

Assumption for Incomplete Data

Records identified as containing suspicious data or errors in data were assumed to possess the same characteristics of "good data" in the same cohort of members.

Converted Leave

Leave credit is accrued throughout a member's career and converted to service credit or paid as a lump sum. Converted leave rates below represent the percentage increase in a retiree's

accrued benefit upon conversion of the leave to benefits. The rates, shown below, are based on the most recent experience study.

	Regular Retirement	Disability
Regular Teachers	1.50%	1.50%
Higher Education	1.50%	1.50%
Lunch Plan A	1.00%	1.00%
Lunch Plan B	1.00%	1.00%

RP-2000 MORTALITY TABLE WITH PROJECTION TO 2025 WITH SCALE AA - Effective July 1, 2014 - FYE 2018

For Regular Teachers Sub Plan, Higher Education Sub Plan, Lunch A Sub Plan and Lunch B Sub Plan.

	Death Rate			Death Rate			Death Rate	
Age	Male	Female	Age	Male	Female	Age	Male	Female
18	0.000196	0.000132	53	0.001760	0.001632	88	0.132854	0.097072
19	0.000205	0.000130	54	0.001929	0.001885	89	0.146819	0.110532
20	0.000214	0.000128	55	0.002243	0.002223	90	0.165921	0.122153
21	0.000227	0.000125	56	0.002667	0.002658	91	0.180722	0.134140
22	0.000238	0.000126	57	0.003057	0.003068	92	0.200931	0.146213
23	0.000256	0.000132	58	0.003523	0.003461	93	0.216754	0.162113
24	0.000271	0.000138	59	0.003972	0.003918	94	0.232553	0.173875
25	0.000292	0.000146	60	0.004508	0.004460	95	0.254433	0.185013
26	0.000325	0.000158	61	0.005261	0.005129	96	0.270045	0.195353
27	0.000337	0.000165	62	0.006002	0.005873	97	0.285214	0.209923
28	0.000347	0.000174	63	0.007038	0.006747	98	0.307507	0.218415
29	0.000363	0.000183	64	0.007929	0.007604	99	0.322050	0.225671
30	0.000392	0.000205	65	0.008953	0.008563	100	0.336045	0.231601
31	0.000440	0.000251	66	0.010389	0.009664	101	0.358628	0.244834
32	0.000496	0.000286	67	0.011590	0.010730	102	0.371685	0.254498
33	0.000557	0.000314	68	0.012562	0.011861	103	0.383040	0.266044
34	0.000619	0.000338	69	0.013920	0.013110	104	0.392003	0.279055
35	0.000682	0.000360	70	0.015219	0.014770	105	0.397886	0.293116
36	0.000742	0.000380	71	0.016839	0.015984	106	0.400000	0.307811
37	0.000798	0.000399	72	0.018697	0.017778	107	0.400000	0.322725
38	0.000829	0.000420	73	0.020825	0.019270	108	0.400000	0.337441
39	0.000857	0.000444	74	0.023233	0.021358	109	0.400000	0.351544
40	0.000883	0.000484	75	0.026595	0.022993	110	0.400000	0.364617
41	0.000911	0.000530	76	0.029643	0.025332	111	0.400000	0.376246
42	0.000945	0.000584	77	0.033819	0.028612	112	0.400000	0.386015
43	0.000985	0.000642	78	0.038544	0.031540	113	0.400000	0.393507
44	0.001033	0.000705	79	0.043933	0.034821	114	0.400000	0.398308
45	0.001087	0.000751	80	0.050067	0.038490	115	0.400000	0.400000
46	0.001136	0.000797	81	0.057467	0.042601	116	0.400000	0.400000
47	0.001188	0.000842	82	0.065843	0.047227	117	0.400000	0.400000
48	0.001243	0.000911	83	0.073396	0.052439	118	0.400000	0.400000
49	0.001300	0.000984	84	0.083709	0.058321	119	0.400000	0.400000
50	0.001358	0.001092	85	0.092919	0.066628	120	1.000000	1.000000
51	0.001516	0.001237	86	0.103019	0.076203			
52	0.001609	0.001419	87	0.117040	0.087152			

RP-2014 MORTALITY TABLE ADJUSTED FOR TRSL EXPERIENCE FACTORS WITH GENERATIONAL PROJECTION PER SCALE MP-2016

Effective beginning for FYE 2019

Pre-Commencement - For Regular Teachers Sub Plan, Higher Education Sub Plan, Lunch A Sub Plan and Lunch B Sub Plan.

	Death Rate			Death Rate			Death Rate	
Age	Male	Female	Age	Male	Female	Age	Male	Female
18	0.000331	0.000138	53	0.002312	0.001258	88		
19	0.000373	0.000143	54	0.002552	0.001362	89		
20	0.000410	0.000143	55	0.002816	0.001472	90		
21	0.000453	0.000143	56	0.003110	0.001588	91		
22	0.000493	0.000143	57	0.003441	0.001712	92		
23	0.000514	0.000146	58	0.003817	0.001845	93		
24	0.000521	0.000149	59	0.004246	0.001990	94		
25	0.000489	0.000152	60	0.004735	0.002149	95		
26	0.000467	0.000158	61	0.005292	0.002325	96		
27	0.000453	0.000165	62	0.005926	0.002520	97		
28	0.000448	0.000172	63	0.006643	0.002739	98		
29	0.000450	0.000181	64	0.007451	0.002982	99		
30	0.000457	0.000192	65	0.008360	0.003252	100		
31	0.000468	0.000203	66	0.009267	0.003619	101		
32	0.000482	0.000215	67	0.010273	0.004028	102		
33	0.000497	0.000227	68	0.011388	0.004483	103		
34	0.000513	0.000239	69	0.012623	0.004989	104		
35	0.000528	0.000252	70	0.013993	0.005552	105		
36	0.000541	0.000264	71	0.015511	0.006178	106		
37	0.000557	0.000280	72	0.017193	0.006875	107		
38	0.000576	0.000298	73	0.019059	0.007652	108		
39	0.000601	0.000321	74	0.021127	0.008515	109		
40	0.000634	0.000348	75	0.023420	0.009476	110		
41	0.000678	0.000381	76	0.025961	0.010545	111		
42	0.000732	0.000420	77	0.028778	0.011736	112		
43	0.000801	0.000466	78	0.031901	0.013060	113		
44	0.000885	0.000518	79	0.035362	0.014534	114		
45	0.000983	0.000578	80	0.039199	0.016174	115		
46	0.001098	0.000645	81			116		
47	0.001227	0.000718	82			117		
48	0.001372	0.000797	83			118		
49	0.001530	0.000881	84			119		
50	0.001703	0.000970	85			120		
51	0.001890	0.001061	86					
52	0.002093	0.001157	87					

Note: Mortality rates above are base rates *before* application of generational projection of mortality improvement using Scale MP-2016.

RP-2014 MORTALITY TABLE ADJUSTED FOR TRSL EXPERIENCE FACTORS WITH GENERATIONAL PROJECTION PER SCALE MP-2016

Effective beginning for FYE 2019

Post-Commencement - For Regular Teachers Sub Plan, Higher Education Sub Plan, Lunch A Sub Plan and Lunch B Sub Plan.

	Death Rate			Death Rate			Death Rate	
Age	Male	Female	Age	Male	Female	Age	Male	Female
18			53	0.005546	0.003193	88	0.119450	0.084378
19			54	0.005922	0.003378	89	0.133649	0.094607
20			55	0.006309	0.003586	90	0.149499	0.106055
21			56	0.006709	0.003819	91	0.166454	0.118547
22			57	0.007126	0.004087	92	0.184164	0.131966
23			58	0.007565	0.004392	93	0.202433	0.146243
24			59	0.008036	0.004741	94	0.221181	0.161341
25			60	0.008548	0.005139	95	0.240415	0.177244
26			61	0.009112	0.005590	96	0.260189	0.193944
27			62	0.009739	0.006094	97	0.280565	0.211429
28			63	0.010441	0.006656	98	0.301587	0.229671
29			64	0.011230	0.007278	99	0.323233	0.248612
30			65	0.012114	0.007968	100	0.345387	0.268149
31			66	0.013108	0.008733	101	0.367802	0.288130
32			67	0.014223	0.009582	102	0.390059	0.308330
33			68	0.015474	0.010527	103	0.411976	0.328581
34			69	0.016876	0.011575	104	0.433380	0.348710
35			70	0.018446	0.012739	105	0.454114	0.368550
36			71	0.020199	0.014029	106	0.474041	0.387941
37			72	0.022155	0.015458	107	0.493050	0.406741
38			73	0.024340	0.017038	108	0.511051	0.424821
39			74	0.026780	0.018787	109	0.527986	0.442079
40			75	0.029509	0.020729	110	0.543814	0.458430
41			76	0.032569	0.022887	111	0.550000	0.473818
42			77	0.036009	0.025298	112	0.550000	0.488206
43			78	0.039884	0.028005	113	0.550000	0.495000
44			79	0.044255	0.031052	114	0.550000	0.495000
45			80	0.049194	0.034496	115	0.550000	0.495000
46			81	0.054775	0.038395	116	0.550000	0.495000
47			82	0.061079	0.042814	117	0.550000	0.495000
48			83	0.068196	0.047822	118	0.550000	0.495000
49			84	0.076219	0.053492	119	0.550000	0.495000
50	0.004470	0.002740	85	0.085247	0.059899	120	1.000000	1.000000
51	0.004822	0.002876	86	0.095383	0.067123			
52	0.005180	0.003026	87	0.106742	0.075252			

Note: Mortality rates above are base rates *before* application of generational projection of mortality improvement using Scale MP-2016.

Basis for the Valuation
REGULAR TEACHERS
ACTUARIAL TABLES AND RATES - Effective July 1, 2014

*Annual salary increases are modeled by compounding Merit Salary Scale with Inflation. For FYE 2017, rate of Inflation is assumed to be 2.50%; effective beginning for FYE 2018, rate of inflation is assumed at 2.25%

	Disability	Termination Rates						Merit
Age	Rates	< 1 Year	1 Year	2 Years	3 Years	>=4 Years	Duration	Salary Scale*
18-22	0.0000	0.200	0.200	0.200	0.095	0.180	0	0.031707
23	0.0001	0.200	0.200	0.200	0.095	0.180	1	0.031707
24	0.0001	0.200	0.200	0.200	0.095	0.180	2	0.031707
25	0.0001	0.180	0.180	0.126	0.095	0.090	3	0.031707
26	0.0001	0.180	0.180	0.126	0.095	0.060	4	0.031707
27	0.0001	0.190	0.190	0.126	0.095	0.060	5	0.024390
28	0.0001	0.190	0.190	0.126	0.095	0.055	6	0.024390
29	0.0001	0.190	0.190	0.126	0.095	0.053	7	0.024390
30	0.0001	0.190	0.190	0.120	0.109	0.053	8	0.024390
31	0.0003	0.190	0.190	0.120	0.109	0.050	9	0.024390
32	0.0003	0.190	0.190	0.120	0.109	0.045	10	0.021951
33	0.0003	0.190	0.190	0.120	0.109	0.045	11	0.021951
34	0.0003	0.190	0.190	0.120	0.109	0.045	12	0.021951
35	0.0006	0.180	0.180	0.117	0.095	0.040	13	0.021951
36	0.0010	0.180	0.180	0.117	0.095	0.040	14	0.021951
37	0.0007	0.180	0.180	0.117	0.095	0.040	15	0.019512
38	0.0007	0.180	0.180	0.117	0.095	0.040	16	0.019512
39	0.0011	0.180	0.180	0.117	0.095	0.040	17	0.019512
40	0.0011	0.165	0.165	0.123	0.090	0.037	18	0.019512
41	0.0013	0.165	0.165	0.123	0.090	0.037	19	0.019512
42	0.0016	0.165	0.165	0.123	0.090	0.037	20	0.014634
43	0.0016	0.165	0.165	0.123	0.090	0.037	21	0.014634
44	0.0016	0.165	0.165	0.123	0.090	0.040	22	0.014634
45-49	0.0022	0.163	0.163	0.099	0.090	0.040	23	0.014634
50	0.0025	0.175	0.175	0.112	0.090	0.040	24	0.014634
51	0.0025	0.175	0.175	0.112	0.090	0.040	25	0.012195
52	0.0025	0.175	0.175	0.112	0.090	0.040	26	0.012195
53	0.0030	0.175	0.175	0.112	0.090	0.040	27	0.012195
54	0.0030	0.175	0.175	0.112	0.090	0.040	28	0.012195
55	0.0040	0.175	0.175	0.106	0.090	0.040	29	0.012195
56	0.0050	0.175	0.175	0.106	0.090	0.040	30	0.017073
57	0.0055	0.155	0.155	0.106	0.090	0.040	31	0.017073
58	0.0055	0.200	0.200	0.106	0.090	0.040	32	0.017073
59	0.0055	0.200	0.200	0.106	0.090	0.040	33	0.017073
60	0.0055	0.200	0.200	0.106	0.090	0.040	>=34	0.017073
61	0.0050	0.200	0.200	0.106	0.090	0.040		
62	0.0050	0.200	0.200	0.106	0.090	0.040		
63	0.0050	0.200	0.200	0.106	0.090	0.040		
64	0.0035	0.200	0.200	0.106	0.090	0.040		
65	0.0035	0.200	0.200	0.106	0.090	0.040		
>=66	0.0020	0.200	0.200	0.106	0.090	0.040		

REGULAR TEACHERS
ACTUARIAL TABLES AND RATES - Effective July 1, 2014

Age	Retirement/DROP Rates*											
	K-12 Pre 07/1999				K-12 07/1999-12/2010				K-12 Post 01/2011			
	0-19 Years	20-24 Years	25-29 Years	>=30 Years	0-4 Years	5-24 Years	25-29 Years	>=30 Years	0-4 Years	5-24 Years	25-29 Years	>=30 Years
<=37	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
38	0.000	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
39	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
40	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
41	0.000	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
42	0.000	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
43	0.000	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
44	0.000	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
45	0.000	0.025	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
46	0.000	0.025	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
47	0.000	0.025	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
48	0.000	0.030	0.020	0.700	0.000	0.000	0.000	0.700	0.000	0.000	0.000	0.000
49	0.000	0.030	0.020	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
50	0.000	0.030	0.050	0.300	0.000	0.000	0.000	0.300	0.000	0.000	0.000	0.000
51	0.000	0.030	0.170	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
52	0.000	0.030	0.280	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
53	0.000	0.100	0.208	0.500	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000
54	0.000	0.150	0.450	0.400	0.000	0.000	0.000	0.400	0.000	0.000	0.000	0.000
55	0.000	0.150	0.750	0.300	0.000	0.000	0.750	0.300	0.000	0.000	0.000	0.000
56	0.000	0.150	0.330	0.200	0.000	0.000	0.330	0.200	0.000	0.000	0.000	0.000
57	0.000	0.150	0.250	0.200	0.000	0.000	0.250	0.200	0.000	0.000	0.000	0.000
58	0.000	0.250	0.250	0.200	0.000	0.000	0.250	0.200	0.000	0.000	0.000	0.000
59	0.000	0.250	0.300	0.200	0.000	0.000	0.300	0.200	0.000	0.000	0.000	0.000
60	0.250	0.250	0.300	0.200	0.000	0.250	0.300	0.200	0.000	0.250	0.300	0.200
61	0.150	0.150	0.300	0.200	0.000	0.150	0.300	0.200	0.000	0.150	0.300	0.200
62	0.150	0.150	0.220	0.250	0.000	0.150	0.220	0.250	0.000	0.150	0.220	0.250
63	0.150	0.150	0.170	0.150	0.000	0.150	0.170	0.150	0.000	0.150	0.170	0.150
64	0.200	0.200	0.200	0.300	0.000	0.200	0.200	0.300	0.000	0.200	0.200	0.300
65	0.200	0.200	0.200	0.300	0.000	0.200	0.200	0.300	0.000	0.200	0.200	0.300
66	0.200	0.200	0.200	0.300	0.000	0.200	0.200	0.300	0.000	0.200	0.200	0.300
67	0.200	0.200	0.200	0.300	0.000	0.200	0.200	0.200	0.000	0.200	0.200	0.200
68	0.200	0.200	0.200	0.300	0.000	0.200	0.300	0.300	0.000	0.200	0.300	0.300
69	0.200	0.200	0.200	0.300	0.000	0.200	0.300	0.300	0.000	0.200	0.300	0.300
70	0.200	0.200	0.200	0.400	0.000	0.200	0.300	0.400	0.000	0.200	0.300	0.400
71	0.200	0.200	0.200	0.200	0.000	0.200	0.300	0.200	0.000	0.200	0.300	0.200
72	0.200	0.200	0.200	0.250	0.000	0.200	0.300	0.250	0.000	0.200	0.300	0.250
73	0.200	0.200	0.200	0.250	0.000	0.200	0.300	0.250	0.000	0.200	0.300	0.250
74	0.200	0.200	0.200	0.250	0.000	0.200	0.300	0.250	0.000	0.200	0.300	0.250
>=75	1	1	1	1	0.000	1	1	1	0.000	1	1	1

Basis for the Valuation
HIGHER EDUCATION
ACTUARIAL TABLES AND RATES - Effective July 1, 2014

*Annual salary increases are modeled by compounding Merit Salary Scale with Inflation. For FYE 2018, rate of Inflation is assumed to be 2.50%; effective beginning for FYE 2019, rate of inflation is assumed at 2.25%

	Disability	Termination Rates						Merit
Age	Rates	< 1 Year	1 Year	2 Years	3 Years	>=4 Years	Duration	Salary Scale*
18-22	0.0000	0.250	0.250	0.250	0.170	0.120	0	0.073171
23	0.0001	0.250	0.250	0.250	0.170	0.120	1	0.073171
24	0.0001	0.250	0.250	0.250	0.170	0.120	2	0.063415
25	0.0001	0.250	0.250	0.250	0.170	0.120	3	0.053659
26	0.0001	0.210	0.210	0.250	0.170	0.120	4	0.014634
27	0.0001	0.210	0.210	0.220	0.170	0.120	5	0.043902
28	0.0001	0.220	0.220	0.220	0.170	0.120	6	0.024390
29	0.0001	0.240	0.240	0.220	0.170	0.120	7	0.043902
30	0.0001	0.250	0.250	0.160	0.170	0.180	8	0.043902
31	0.0001	0.220	0.220	0.178	0.170	0.100	9	0.019512
32	0.0001	0.220	0.220	0.190	0.160	0.100	10	0.019512
33	0.0001	0.190	0.190	0.170	0.150	0.120	11	0.019512
34	0.0001	0.230	0.230	0.155	0.100	0.120	12	0.019512
35	0.0001	0.220	0.220	0.175	0.130	0.120	13	0.019512
36	0.0001	0.220	0.220	0.160	0.150	0.120	14	0.014634
37	0.0001	0.220	0.220	0.108	0.150	0.120	15	0.014634
38	0.0001	0.190	0.190	0.180	0.150	0.100	16	0.014634
39	0.0001	0.190	0.190	0.140	0.150	0.100	17	0.014634
40	0.0001	0.230	0.230	0.185	0.150	0.100	18	0.014634
41	0.0001	0.165	0.165	0.108	0.150	0.100	19	0.014634
42	0.0001	0.230	0.230	0.115	0.150	0.100	20	0.014634
43	0.0001	0.155	0.155	0.168	0.150	0.100	21	0.014634
44	0.0001	0.195	0.195	0.135	0.150	0.100	22	0.014634
45	0.0001	0.190	0.190	0.116	0.150	0.100	23	0.014634
46	0.0008	0.162	0.162	0.170	0.150	0.080	24	0.014634
47	0.0008	0.210	0.210	0.140	0.150	0.090	25	0.014634
48	0.0008	0.135	0.135	0.180	0.150	0.090	26	0.014634
49	0.0008	0.135	0.135	0.125	0.150	0.090	27	0.009756
50	0.0008	0.185	0.185	0.108	0.060	0.090	28	0.009756
51	0.0008	0.145	0.145	0.070	0.050	0.090	29	0.009756
52	0.0008	0.155	0.155	0.110	0.095	0.090	30	0.009756
53	0.0008	0.220	0.220	0.130	0.125	0.090	31	0.009756
54	0.0008	0.220	0.220	0.075	0.017	0.090	32	0.009756
55	0.0008	0.200	0.200	0.104	0.140	0.090	33	0.009756
56	0.0020	0.135	0.135	0.122	0.100	0.080	>=34	0.009756
57	0.0020	0.250	0.250	0.055	0.140	0.080		
58	0.0020	0.100	0.100	0.115	0.200	0.100		
59	0.0005	0.100	0.100	0.210	0.125	0.080		
>=60	0.0005	0.150	0.150	0.160	0.090	0.060		

HIGHER EDUCATION
ACTUARIAL TABLES AND RATES - Effective July 1, 2014

		Retirement/DROP Rates*											
		Higher Ed. Pre 07/1999				Higher Ed. 07/1999-12/2010				Higher Ed. Post 01/2011			
Age	0-4	5-19	20-24	25-29	>=30	0-4	5-24	25-29	>=30	0-4	5-24	25-29	>=30
	Years	Years	Years	Years	Years	Years	Years	Years	Years	Years	Years	Years	Years
<=37	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
38	0.000	0.000	0.100	0.080	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
39	0.000	0.000	0.100	0.080	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
40	0.000	0.000	0.100	0.080	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
41	0.000	0.000	0.100	0.080	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
42	0.000	0.000	0.100	0.080	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
43	0.000	0.000	0.070	0.080	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
44	0.000	0.000	0.070	0.080	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
45	0.000	0.000	0.070	0.080	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
46	0.000	0.000	0.070	0.080	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
47	0.000	0.000	0.070	0.080	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
48	0.000	0.000	0.070	0.080	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
49	0.000	0.000	0.070	0.080	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
50	0.000	0.000	0.070	0.080	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
51	0.000	0.000	0.070	0.160	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
52	0.000	0.000	0.070	0.160	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
53	0.000	0.000	0.070	0.160	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000
54	0.000	0.000	0.150	0.280	0.400	0.000	0.000	0.000	0.400	0.000	0.000	0.000	0.000
55	0.000	0.000	0.150	0.350	0.200	0.000	0.000	0.350	0.200	0.000	0.000	0.000	0.000
56	0.000	0.000	0.150	0.200	0.050	0.000	0.000	0.200	0.050	0.000	0.000	0.000	0.000
57	0.000	0.000	0.150	0.130	0.050	0.000	0.000	0.130	0.050	0.000	0.000	0.000	0.000
58	0.000	0.000	0.150	0.130	0.050	0.000	0.000	0.130	0.050	0.000	0.000	0.000	0.000
59	0.000	0.000	0.150	0.130	0.050	0.000	0.000	0.130	0.050	0.000	0.000	0.000	0.000
60	0.000	0.150	0.150	0.130	0.050	0.000	0.150	0.130	0.050	0.000	0.150	0.130	0.050
61	0.000	0.120	0.120	0.120	0.120	0.000	0.120	0.120	0.120	0.000	0.120	0.120	0.120
62	0.000	0.120	0.120	0.120	0.120	0.000	0.120	0.120	0.120	0.000	0.120	0.120	0.120
63	0.000	0.120	0.120	0.120	0.120	0.000	0.120	0.120	0.120	0.000	0.120	0.120	0.120
64	0.000	0.120	0.120	0.120	0.120	0.000	0.120	0.120	0.120	0.000	0.120	0.120	0.120
65	0.000	0.120	0.120	0.160	0.200	0.000	0.120	0.160	0.200	0.000	0.120	0.160	0.200
66	0.000	0.120	0.120	0.160	0.180	0.000	0.120	0.160	0.180	0.000	0.120	0.160	0.180
67	0.000	0.120	0.120	0.160	0.180	0.000	0.120	0.160	0.180	0.000	0.120	0.160	0.180
68	0.000	0.120	0.120	0.160	0.180	0.000	0.120	0.160	0.180	0.000	0.120	0.160	0.180
69	0.000	0.120	0.120	0.160	0.280	0.000	0.120	0.160	0.280	0.000	0.120	0.160	0.280
70	0.000	0.120	0.120	0.160	0.280	0.000	0.120	0.160	0.280	0.000	0.120	0.160	0.280
71	0.000	0.120	0.120	0.160	0.200	0.000	0.120	0.160	0.200	0.000	0.120	0.160	0.200
72	0.000	0.120	0.120	0.160	0.200	0.000	0.120	0.160	0.200	0.000	0.120	0.160	0.200
73	0.000	0.120	0.120	0.160	0.200	0.000	0.120	0.160	0.200	0.000	0.120	0.160	0.200
74	0.000	0.120	0.120	0.160	0.200	0.000	0.120	0.160	0.200	0.000	0.120	0.160	0.200
>=75	0.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000

Basis for the Valuation
LUNCH PLAN A
ACI'UARIAL TABLES AND RATES - Effective July 1, 2014

*Annual salary increases are modeled by compounding Merit Salary Scale with Inflation. For FYE 2018, rate of Inflation is assumed to be 2.50%; effective beginning for FYE 2019, rate of inflation is assumed at 2.25%

	Disability	Retirement Rates					Termination	Merit
Age	Rates	0-4 Years	5-24 Years	25-29 Years	>=30 Years	Duration	Rates	Salary Scale*
<=30	0.0000	0.00	0.00	0.00	0.00	0	0.140	0.034146
31-37	0.0001	0.00	0.00	0.00	0.00	1	0.140	0.034146
38	0.0001	0.00	0.00	0.00	0.30	2	0.140	0.034146
39	0.0001	0.00	0.00	0.00	0.30	3	0.140	0.034146
40	0.0001	0.00	0.00	0.00	0.30	4	0.140	0.034146
41	0.0001	0.00	0.00	0.00	0.30	5	0.140	0.034146
42	0.0001	0.00	0.00	0.00	0.30	6	0.140	0.034146
43	0.0001	0.00	0.00	0.00	0.30	7	0.140	0.034146
44	0.0001	0.00	0.00	0.00	0.30	8	0.140	0.034146
45	0.0001	0.00	0.00	0.00	0.30	9	0.140	0.034146
46	0.0001	0.00	0.00	0.00	0.30	10	0.140	0.034146
47	0.0001	0.00	0.00	0.00	0.30	11	0.140	0.034146
48	0.0001	0.00	0.00	0.00	0.30	12	0.140	0.021951
49	0.0100	0.00	0.00	0.00	0.30	13	0.140	0.021951
50	0.0100	0.00	0.00	0.00	0.30	14	0.140	0.021951
51	0.0100	0.00	0.00	0.00	0.30	15	0.140	0.034146
52	0.0150	0.00	0.00	0.00	0.70	16	0.140	0.034146
53	0.0175	0.00	0.00	0.00	0.70	17	0.140	0.043902
54	0.0175	0.00	0.00	0.00	0.70	18	0.140	0.043902
55	0.0175	0.00	0.00	0.80	0.70	19	0.140	0.010732
56	0.0002	0.00	0.00	0.35	0.70	20	0.140	0.010732
57	0.0002	0.00	0.00	0.35	0.70	21	0.140	0.010732
58	0.0002	0.00	0.00	0.35	0.70	22	0.140	0.010732
59	0.0002	0.00	0.00	0.60	0.70	23	0.140	0.034146
60	0.0002	0.00	0.45	0.45	0.70	24	0.140	0.034146
61	0.0002	0.00	0.20	0.20	0.50	25	0.140	0.014634
62	0.0002	0.00	0.20	0.20	0.50	26	0.140	0.014634
63	0.0002	0.00	0.35	0.35	0.50	27	0.140	0.014634
64	0.0002	0.00	0.10	0.10	0.50	28	0.140	0.014634
65	0.0002	0.00	0.10	0.10	0.50	29	0.140	0.014634
66	0.0002	0.00	0.10	0.10	0.25	30+	0.140	0.014634
67	0.0002	0.00	0.20	0.20	0.25			
68	0.0002	0.00	0.20	0.20	0.25			
69	0.0002	0.00	0.20	0.20	0.25			
70	0.0002	0.00	0.20	0.20	0.25			
71	0.0002	0.00	0.20	0.20	0.25			
72	0.0002	0.00	0.20	0.20	0.25			
73	0.0002	0.00	0.20	0.20	0.25			
74	0.0002	0.00	0.20	0.20	0.25			
>=75	0.0002	0.00	1.00	1.00	1.00			

LUNCH PLAN B
ACTUARIAL TABLES AND RATES - Effective July 1, 2014

*Annual salary increases are modeled by compounding Merit Salary Scale with Inflation. For FYE 2018, rate of Inflation is assumed to be 2.50%; effective beginning for FYE 2019, rate of inflation is assumed at 2.25%

	Disability	Retirement		Termination	Merit
Age	Rates	Rates	Duration	Rates	Scale*
<=35	0.0000	0.00	0	0.100	0.029268
36-39	0.0010	0.00	1	0.090	0.029268
40	0.0050	0.00	2	0.080	0.029268
41	0.0050	0.00	3	0.070	0.029268
42	0.0050	0.00	4	0.060	0.029268
43	0.0050	0.00	5	0.050	0.029268
44	0.0050	0.00	6	0.050	0.029268
45	0.0050	0.00	7	0.045	0.029268
46	0.0050	0.00	8	0.045	0.029268
47	0.0050	0.00	9	0.045	0.029268
48	0.0050	0.00	10	0.045	0.029268
49	0.0050	0.00	11	0.045	0.019512
50	0.0130	0.00	12	0.040	0.019512
51	0.0130	0.00	13	0.030	0.019512
52	0.0130	0.00	14	0.030	0.019512
53	0.0130	0.00	15	0.030	0.019512
54	0.0130	0.00	16	0.050	0.024390
55	0.0175	0.80	17	0.050	0.024390
56	0.0175	0.80	18	0.050	0.024390
57	0.0225	0.80	19	0.030	0.014634
58	0.0225	0.80	20	0.040	0.014634
59	0.0150	0.60	21	0.040	0.014634
60	0.0050	0.50	22	0.040	0.014634
61	0.0050	0.25	23	0.040	0.014634
62	0.0050	0.25	24	0.040	0.014634
63	0.0050	0.25	25	0.040	0.014634
64	0.0010	0.25	26	0.040	0.014634
65	0.0010	0.15	27	0.040	0.014634
66	0.0010	0.15	28	0.040	0.014634
67	0.0010	0.30	29	0.040	0.014634
68	0.0010	0.45	30+	0.040	0.014634
69	0.0010	0.20			
70	0.0010	0.20			
71	0.0010	0.20			
72	0.0010	0.20			
73	0.0010	0.20			
74	0.0010	0.20			
>=75	0.0010	1.00			

APPENDIX A
CONTRIBUTION RATES FOR SUB-PLANS

Appendix A: Contribution Rates for Sub-Plans

The calculations of employer contribution rates for FYE 2019 for employers participating in each sub-plan of TRSL are shown below. These contribution requirements are based on revised assumptions and methods.

A. Regular Teachers, Lunch Plan A and Lunch Plan B Sub Plans (Combined)

	Dollar Contribution	Projected Payroll	Contribution Rate
Employer Normal Cost	$ 281,395,514	$ 3,486,594,150	8.070785%
Shared Amortization Costs	1,015,475,384		29.125139%
Administrative Expenses	15,689,674		0.450000%
Total	$ 1,312,560,572		37.6459%

B. Higher Education Sub Plan for Non ORP Members

	Dollar Contribution	Projected Payroll	Contribution Rate
Employer Normal Cost	$ 36,925,940	$ 614,790,900	6.006260%
Shared Amortization Costs	179,058,703		29.125139%
Administrative Expenses	2,766,559		0.450000%
Total	$ 218,751,202		35.5814%

C. Higher Education Sub Plan for ORP Members

	Dollar Contribution	Projected Payroll	Contribution Rate
Employer Normal Cost	$ -	$ -	0.000000%
Shared Amortization Costs	165,837,166	569,395,286	29.125139%
Administrative Expenses	-	-	0.000000%
Total	$ 165,837,166		29.1251%

D. Total For All Sub Plans

	Dollar Contribution	Projected Payroll	Contribution Rate
Employer Normal Cost	$ 318,321,454	$ 4,101,385,050	7.761316%
Shared Amortization Costs	$ 1,360,371,253	4,670,780,336	29.125139%
Administrative Expenses	$ 18,456,233	4,101,385,050	0.450000%
Net Employer Cost	$ 1,697,148,940		37.3365%

Appendix A: Contribution Rates for Sub-Plans

The calculations of employer contribution rates for FYE 2019 for employers participating in each sub-plan of TRSL are shown below. These contribution requirements are based on revised assumptions and methods.

A. Regular Teachers, Lunch Plan A and Lunch Plan B Sub Plans (Combined)

	Dollar Contribution	Projected Payroll	Contribution Rate
Employer Normal Cost	$ 281,395,514	$ 3,486,594,150	8.070785%
Shared Amortization Costs	1,015,475,384		29.125139%
Administrative Expenses	15,689,674		0.450000%
Total	$ 1,312,560,572		37.6459%

B. Higher Education Sub Plan for Non ORP Members

	Dollar Contribution	Projected Payroll	Contribution Rate
Employer Normal Cost	$ 36,925,940	$ 614,790,900	6.006260%
Shared Amortization Costs	179,058,703		29.125139%
Administrative Expenses	2,766,559		0.450000%
Total	$ 218,751,202		35.5814%

C. Higher Education Sub Plan for ORP Members

	Dollar Contribution	Projected Payroll	Contribution Rate
Employer Normal Cost	$ -	$ -	0.000000%
Shared Amortization Costs	165,837,166	569,395,286	29.125139%
Administrative Expenses	-	-	0.000000%
Total	$ 165,837,166		29.1251%

D. Total For All Sub Plans

	Dollar Contribution	Projected Payroll	Contribution Rate
Employer Normal Cost	$ 318,321,454	$ 4,101,385,050	7.761316%
Shared Amortization Costs	$ 1,360,371,253	4,670,780,336	29.125139%
Administrative Expenses	$ 18,456,233	4,101,385,050	0.450000%
Net Employer Cost	$ 1,697,148,940		37.3365%

APPENDIX B
BASIS FOR MORTALITY ASSUMPTIONS

The actuary for the LLA is required by R.S. 11:127(C) to prepare an actuarial valuation for review by PRSAC. As such, we accepted most of the actuarial assumptions currently used by the retirement board and its actuary. Among a few exceptions is the mortality assumption, for which we employed a different approach for current and future mortality rates used in our actuarial valuation of the system's costs and liabilities.

This Appendix B describes our approach to development of new mortality tables.

Plan Experience

The mortality tables employed in the actuarial valuation were developed directly from the mortality experience of the group.

Experience Study

An Actuarial Experience Study was prepared by Foster & Foster for the period from July 1, 2007 through June 30, 2012 for the Teachers' Retirement System of Louisiana (TRSL). Their experience study report, dated March 27, 2013, summarized the results. The following table shows the mortality experience during the exposure period:

	Active Members				Retiree Members			
	Males		Females		Males		Females	
Age	Exposures	Actual Deaths	Exposures	Actual Deaths	Exposures	Actual Deaths	Exposures	Actual Deaths
<20	3	0	10	0	196	1	210	-
20-24	1,360	0	5,884	1	256	0	331	-
25-29	6,850	4	31,635	5	62	0	173	2
30-34	8,616	4	40,168	16	309	1	1,732	2
35-39	9,372	11	45,498	22	713	1	3,313	2
40-44	9,477	5	48,717	42	974	2	4,019	1
45-49	9,137	15	53,361	78	1,232	7	5,786	14
50-54	9,420	25	54,309	88	2,869	20	14,044	25
55-59	8,233	33	37,759	77	9,149	64	41,295	124
60-64	5,362	29	17,244	53	15,175	140	53,185	262
65-69	2,043	21	4,438	25	15,914	229	45,034	402
70-74	726	7	1,360	10	13,863	326	35,676	578
75-79	0	0	0	0	11,504	444	28,465	737
80-84	0	0	0	0	6,875	480	19,689	1,036
85-89	0	0	0	0	3,480	422	11,809	1,070
90-94	0	0	0	0	1044	203	5,597	887
95-99	0	0	0	0	171	66	1465	349
100+	0	0	0	0	5	1	174	68
Total	70,599	154	340,383	417	83,791	2,407	271,997	5,559

Credibility

Actuarial credibility pertains to the statistical confidence we can have in the results of an experience study for projecting future mortality rates.

Full credibility means that the data is fully reliable as a reasonable predictor of future experience and "adjustment factors" can be developed and applied to a standard reference table to obtain a new mortality table that make full use of the group's own experience. This retains the shape of the standard reference table, but adjusts the rates to reflect the group's own actual experience.

If an experience study's data is partially credible, a weighted average adjustment factor should be applied to the standard reference table's individual mortality rates to obtain a new mortality rates for each individual age that partially reflects the group's own experience and partially reflects the standard reference table.

For the purpose of this analysis, full credibility was assigned a confidence level of 90% of being within 5% margin from the correct value. The credibility TRSL's data was assessed separately for males and females, and separately for actives and inactives, making a total of four sets of data. In order to be fully credible, the experience study is required to have at least 1,082 deaths during the exposure period for each subgroup.

Based on the information in the above table, the TRSL's experience study data is fully credible for each group (males and females), since their respective numbers of deaths are more than 1,082 each. The credibility factors are therefore 100% for retired males and females. This means 100% of the experience study results can be taken into account in the determination of the mortality assumption for retired males and females. However, the experience study data for actives males and females is only partially credible, since their respective number of deaths is less than 1,082 each.

Formula

This process is outlined in actuarial literature.[1] Following is the basic formula for determining new mortality rates for each age (in each of the four sub-groups) to be used in this valuation.

$$\left[\left(\frac{q_A^{ES}}{q_A^{SR}}\right) \times (\mathbf{C}) \; + \; (\mathbf{1.0}) \times (\mathbf{1} - \mathbf{C})\right] \times q_x^{SR} = q_x^{V}$$

[1] A few examples in actuarial literature on reflecting fully credible and partially credible mortality experience in selecting mortality assumptions for pension valuations include: (a) A Public Policy Practice Note "*Selecting and Documenting Mortality Assumptions for Pensions"*, Revised June 2015, published by the American Academy of Actuaries (see especially Appendix 2), found at http://www.actuary.org/files/Mortality_PN_060515_0.pdf, (b) "*Selecting Mortality Tables: A Credibility Approach*", by Gavin Benjamin published by the Society of Actuaries in October 2008, found at www.soa.org/files/research/projects/research-2008-benjamin.pdf and (c) "*Credibility Theory for Pension Actuaries Webcast*", June 23, 2017 sponsored by the Society of Actuaries, found at https://www.soa.org/prof-dev/events/2016-credibility-theory-pension-actuaries/.

Where,

q_x^V is the probability (absolute rate) of a member age **x** dying before attaining age x+1, as used in this actuarial **V**aluation;

q_x^{SR} is the probability (absolute rate) of a member age **x** dying before attaining age x+1, as taken from the **S**tandard **R**eference table;

C is the **C**redibility factor assigned to the data in the experience study; C and (1-C) serve as weights in the weighted average adjustment factor (for TRSL, the Credibility factors for retired males and females are both 100%, while the Credibility factors for active males and females are 37.7% and 62.1%, respectively);

q_A^{ES} is the **A**verage probability (absolute rate), derived as an average or composite rate for the whole group from the **E**xperience **S**tudy, i.e., total deaths divided by total exposures; and

q_A^{SR} is the **A**verage probability (absolute rate), derived as an average or composite rate for the whole group expected by the **S**tandard **R**eference table.

RP-2014/MP-2016

Base RP-2014 Mortality Tables

The RP-2014 Mortality Tables are the most recently developed broad-based mortality tables and were issued by the Retirement Plans Experience Committee (RPEC) of the Society of Actuaries. These were published in October 2014. These tables constitute the most recent and reliable standard reference tables available.

The RP-2014 mortality tables are therefore used as the standard reference tables in determining the mortality assumption for this valuation. The RP-2014 mortality tables were not used as the base mortality table assumption in this actuarial valuation. The shape of RP-2014 was retained; but the mortality rates actually used as the base table in this actuarial valuation were the RP-2014 rates multiplied by TRSL-derived adjustment factors.

The following table shows the mortality rates based on the RP-2014 healthy life mortality tables for different ages for all four sub-groups:

Sample Attained Age	Probability of Death Next Year			
	Actives		Retirees	
	Male	Female	Male	Female
50	0.17%	0.11%	0.41%	0.28%
55	0.28%	0.17%	0.57%	0.36%
60	0.47%	0.24%	0.78%	0.52%
65	0.83%	0.37%	1.10%	0.80%
70	1.39%	0.63%	1.68%	1.29%
75	2.32%	1.08%	2.68%	2.09%
80	3.88%	1.84%	4.47%	3.48%

TRSL-derived adjustment factors

TRSL-derived adjustment factors to be applied to the active and retiree RP-2014 mortality tables were calculated separately for males and females. To do so, the four RP-2014 mortality tables were projected backward to 2010 (using projection scale MP-2014) to match the central year of the experience study. These tables became the new standard reference table so as to line up with the central year of the experience study.

The ratio of the average/composite mortality rate from the experience study (q_A^{ES}) to the average/composite mortality rate of the combined RP-2014 mortality table projected backward to 2010 (q_A^{SR}) was calculated for each of the four sub-groups.

1. For male actives members, since the credibility factor is 37.7%, the experience-derived adjustment factor is based on a blend of the actual mortality rates and the mortality rates of the male non-annuitant RP-2014 mortality table projected backward to 2010.

   For male active members, the TRSL-derived adjustment factor is 101%. That ratio was calculated by dividing the average/composite blended mortality rate from the experience study (0.219%=q_A^{ES}) by the average/composite mortality rate of the male non-annuitant RP-2014 mortality table projected backward to 2010 (0.215%=q_A^{SR}).

2. For female active members, since the credibility factor is 62.1%, the experience factor is based on a blend of the actual mortality rates and the mortality rates of the female non-annuitant RP-2014 mortality table projected backward to 2010

   For female active members, the TRSL-derived experience factor is 88%. That ratio was calculated by dividing the average/composite blended mortality rate from the experience study (0.124%=q_A^{SR}) by the average/composite mortality rate of the female non-annuitant RP-2014 mortality table projected backward to 2010 (0.154%=q_A^{SR}).

3. For the retired male members, since the credibility factor is 100%, the experience factor is based on the actual mortality rates without blending.

   For male retiree members, the TRSL-derived experience factor is 110%. That ratio was calculated by dividing the average/composite mortality rate from the experience study (2.87%=q_A^{ES}) by the average/composite mortality rate of the male annuitant RP-2014 mortality table projected backward to 2010 (2.62%=q_A^{SR}).

4. For the retired female members, since the credibility factor is 100%, the experience factor is based on the actual mortality rates without blending.

   For female retiree members, the TRSL-derived experience factor is 99%. That ratio was calculated by dividing the average/composite mortality rate from the experience study (2.04%=q_A^{ES}) by the average/composite mortality rate of the female annuitant RP-2014 mortality table projected backward to 2010 (2.07%=q_A^{SR}).

Again, in the formula, above, the credibility factor is 100% for male and female retired members, 37.7% for active male members, and 62.1% for female members and the adjustment factor is the part in brackets.

It is not preferable to ignore credible data from a group's own experience study and simply use the standard reference table without adjustment. Nor is it preferable to merely eye-ball the results and margins. It was a simple enough process to follow standard and generally accepted actuarial practice (and the formula above) to develop experience-driven base tables with a standard mortality improvement scale.

Impact on mortality rates

Base Mortality table	Average Mortality Rate
(a) Experience Study Results	1.11%
(b) RP-2000 projected to 2025 with Scale AA	0.72%
(c) Experience-adjusted RP-2014 (base rates)	1.08%

The above table compares (a) the average/composite mortality rates from the raw results of the experience study, (b) the average/composite mortality rate assumed by TRSL's actuary using the older RP-2000 table projected to 2025 with the older Scale AA and (c) the average/composite mortality rate assumed by the LLA's actuary using the experience-adjusted RP-2014 table before any projection of mortality improvement.

The LLA actuary's base table average/composite mortality rate (1.08%) is very close to the one from the experience study (1.11%) since the experience study was largely credible and was incorporated in the determination of the mortality assumption.

MP-2016 Improvement Scale

The improvement scale projects the mortality rates from the base year (2014) of the mortality table to future years to account for future improvement in the mortality rates. The MP-2016 improvement scale, released in October 2016, is intended to be used along with the RP-2014 mortality tables and is the most recent improvement scale available as of the valuation date. The MP-2016 improvement scale is therefore used. The MP-2016 generational improvement scale was applied to the TRSL-adjusted version of RP-2014 base table.

The actuarial profession (as represented by the RPEC of the Society of Actuaries) prefers this generational approach for recognizing future mortality improvement, rather than simply projecting improvements to a static future date.

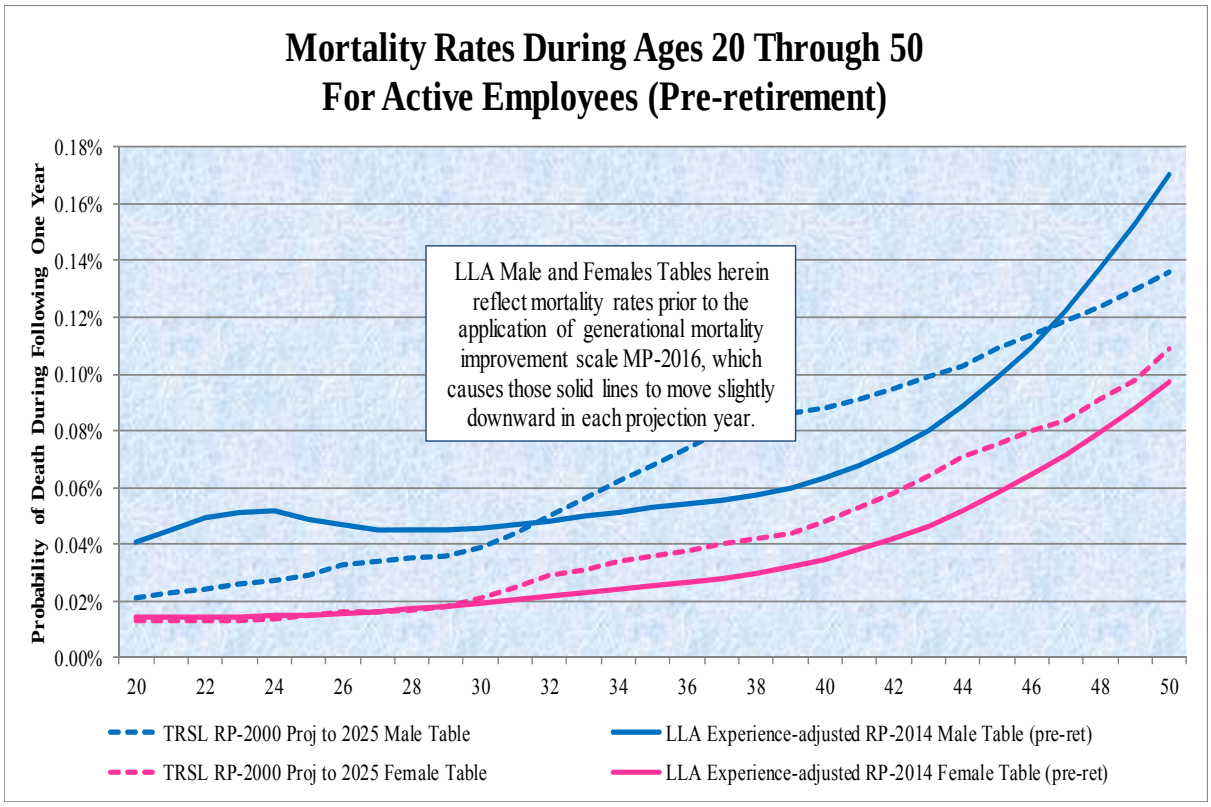
Four graphs on the following pages show the mortality rates for the current mortality assumption (RP-2000 mortality tables projected to 2025 with improvement scale AA) and the new mortality assumption (experience-adjusted RP-2014 mortality tables) *prior to* the application of the MP-2016 improvement scale. The graphs show the mortality rates for males and females for ages 20 to 100.

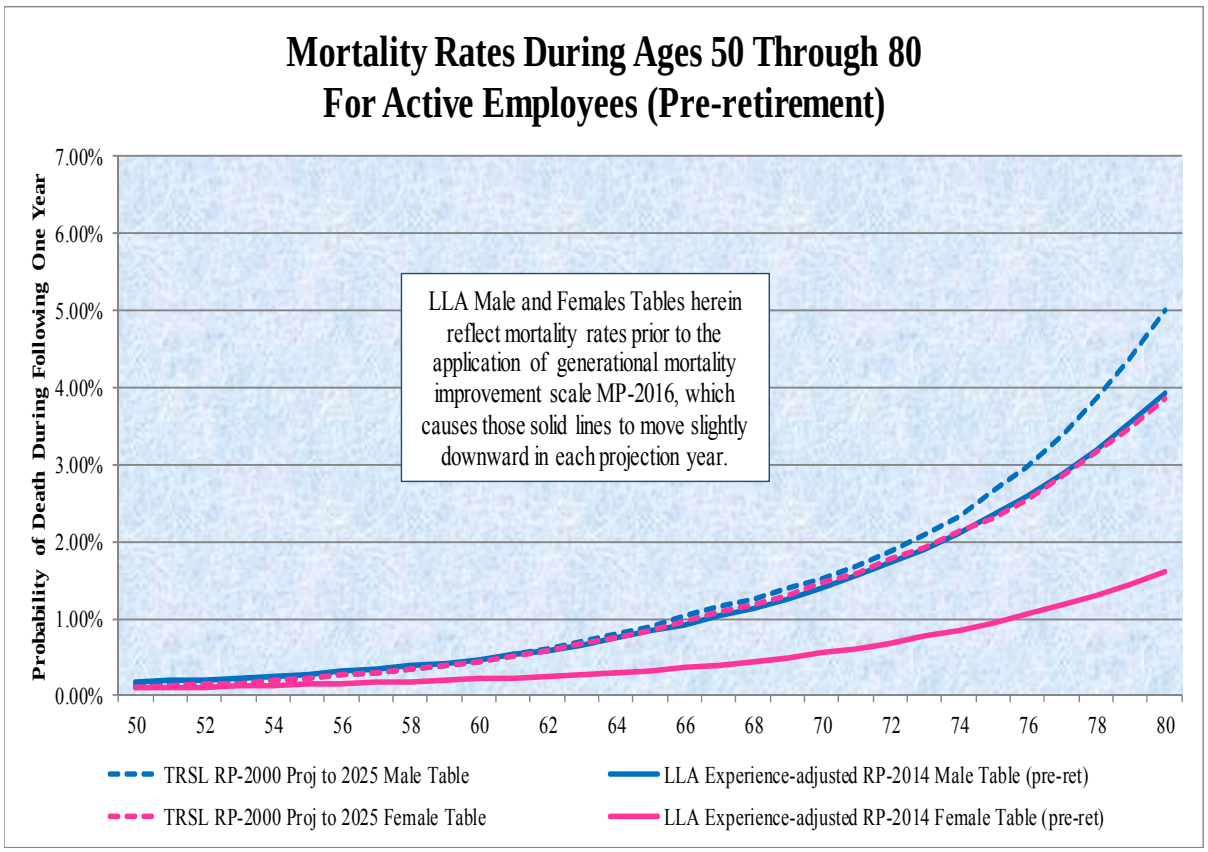
Actuarial Practice

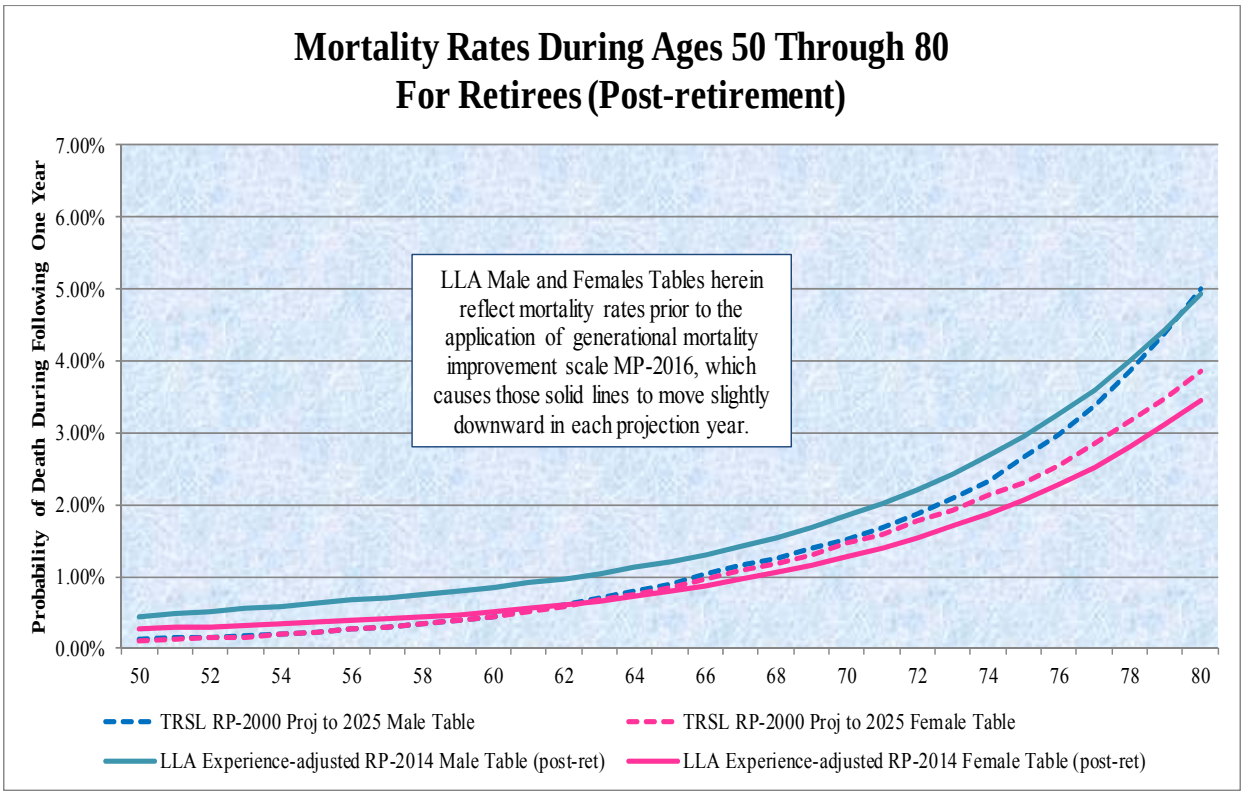
The LLA's actuary recognizes the experience studies for larger systems are generally performed every five years and the next such study for TRSL is not scheduled until 2018. However, it is also generally accepted among retirement system executives, board members and actuaries that if events occur or if better or new techniques emerge between experience studies that materially affect results, they would be considered for change.

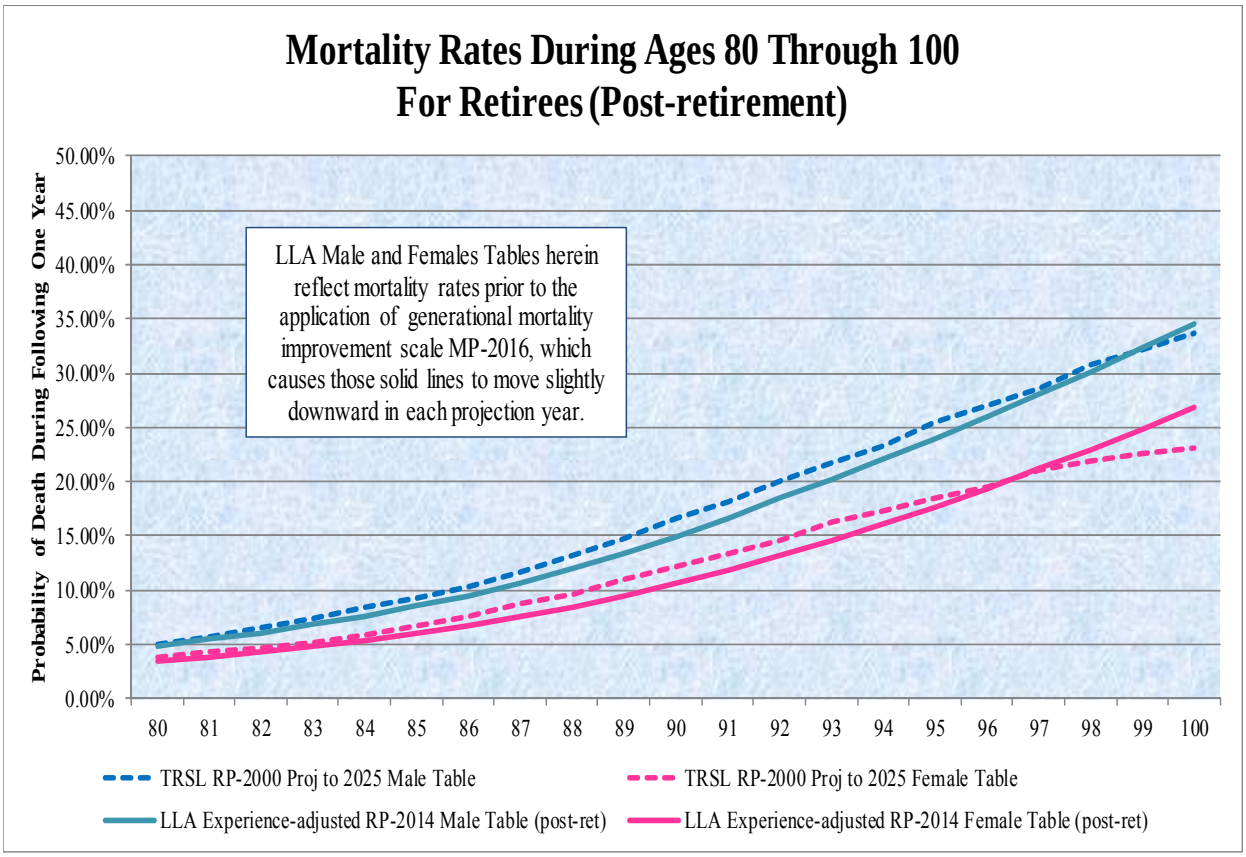
Furthermore, Actuarial Standard of Practice (ASOP) No. 35, "*Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*", states that at each measurement date the actuary should determine whether the assumptions continue to be reasonable, which includes the requirement to take into account historical and current demographic data that is relevant as of the measurement date.

The LLA's actuary believes the mortality table used in this 2017 actuarial valuation (developed as described above) satisfies that ASOP and the current actuarial literature.


Mortality Rates During Ages 20 Through 50
For Active Employees (Pre-retirement)
Probability of Death During Following One Year
0.18%
0.16%
0.14%
0.12%
0.10%
0.08%
0.06%
0.04%
0.02%
0.00%
20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
LLA Male and Females Tables herein reflect mortality rates prior to the application of generational mortality improvement scale MP-2016, which causes those solid lines to move slightly downward in each projection year.
TRSL RP-2000 Proj to 2025 Male Table
TRSL RP-2000 Proj to 2025 Female Table
LLA Experience-adjusted RP-2014 Male Table (pre-ret)
LLA Experience-adjusted RP-2014 Female Table (pre-ret)


Mortality Rates During Ages 50 Through 80
For Active Employees (Pre-retirement)
Probability of Death During Following One Year
7.00%
6.00%
5.00%
4.00%
3.00%
2.00%
1.00%
0.00%
50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
LLA Male and Females Tables herein reflect mortality rates prior to the application of generational mortality improvement scale MP-2016, which causes those solid lines to move slightly downward in each projection year.
TRSL RP-2000 Proj to 2025 Male Table
TRSL RP-2000 Proj to 2025 Female Table
LLA Experience-adjusted RP-2014 Male Table (pre-ret)
LLA Experience-adjusted RP-2014 Female Table (pre-ret)


Mortality Rates During Ages 50 Through 80
For Retirees (Post-retirement)
Probability of Death During Following One Year
7.00%
6.00%
5.00%
4.00%
3.00%
2.00%
1.00%
0.00%
50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80
LLA Male and Females Tables herein reflect mortality rates prior to the application of generational mortality improvement scale MP-2016, which causes those solid lines to move slightly downward in each projection year.
TRSL RP-2000 Proj to 2025 Male Table
TRSL RP-2000 Proj to 2025 Female Table
LLA Experience-adjusted RP-2014 Male Table (post-ret)
LLA Experience-adjusted RP-2014 Female Table (post-ret)


Mortality Rates During Ages 80 Through 100
For Retirees (Post-retirement)
Probability of Death During Following One Year
50.00%
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
LLA Male and Females Tables herein reflect mortality rates prior to the application of generational mortality improvement scale MP-2016, which causes those solid lines to move slightly downward in each projection year.
TRSL RP-2000 Proj to 2025 Male Table
TRSL RP-2000 Proj to 2025 Female Table
LLA Experience-adjusted RP-2014 Male Table (post-ret)
LLA Experience-adjusted RP-2014 Female Table (post-ret)

APPENDIX C
BASIS FOR ECONOMIC ASSUMPTIONS

The actuary for the LLA is required by R.S. 11:127(C) to prepare an actuarial valuation for review by PRSAC. As such, we accepted most of the actuarial assumptions currently used by the retirement board and its actuary. Two exceptions are the future inflation and net investment return assumptions. We developed and employed different inflation and return assumptions in our actuarial valuation of the system's costs and liabilities.

This Appendix C describes our approach to developing the return assumption (including the inflation assumption).

Principles for Setting Pension Return Assumptions

The purpose of the return assumption is to be a forecast of what the pension portfolio is expected to earn in the future. While we are cognizant of the financial burden that pension contributions place on participating employers, our responsibility is to measure costs and liabilities without being unduly influenced by the resulting contribution requirement for a given return assumption.

The pension return assumption should be a reasonable and defensible best estimate of the future net investment return of the pension portfolio over the given horizon. It should be based on the professional forecasts of independent subject matter experts and should be appropriate for use in an actuarial valuation of a retirement system. While we understand that different professionals may have differing opinions about the future, we do not believe the pension return assumption is a lever to adjust up or down depending on what is affordable at the time.

Our primary focus is on following a robust and analytical process for objectively adopting an appropriate forecast of the pension portfolio's future earnings. We recognize the initial contribution shock caused by a change in return assumption of this magnitude (reducing the return assumption from 8.20% to 6.75%). But we choose to separate the dispassionate setting of a return assumption from the budget implications; not ignore the budget implications, but address them in a separate discussion.

1. Our primary role is to submit our actuarial valuation based on our assumptions and advise PRSAC accordingly.

2. Whether the participating employers can continue to afford the required contributions in the near term is a separate and important discussion concerning:

    a. Affordable benefit levels and

    b. A sustainable funding policy to phase into the contributions and liabilities presented in this valuation report. We have potential solutions for PRSAC to consider for phasing into the contributions and liabilities presented in this valuation report, which are outside the scope of this actuarial valuation and which can be discussed at the January 2018 PRSAC meeting.

Nevertheless, a reasonable and defensible best estimate of future net investment returns:

a. Provides the most unbiased measure of the unfunded actuarial liability that is reported to the public,

b. Provides the most responsible funding levels for the benefit security of plan members and

c. Achieves an appropriate balance of intergenerational equity (does not unduly "kick the can down the road").

This *purpose* of the return assumption is what drives our *process* for setting the assumption used in this actuarial valuation (6.75%).

Process for Setting the Pension Return Assumption

We follow a robust and disciplined process for setting the return assumption (including the inflation assumption). The process includes these elements:

1. Perspectives.
2. Horizon.
3. Inflation forecasts from independent experts.
4. Asset Allocation.
5. Investment return forecasts from independent experts.
6. Consensus of multiple independent experts

Perspectives

There are two types of perspectives to consider when defending or determining assumptions for a future net rate of return of a pension fund and a future rate of inflation. One is temporal – Do we look more to historical rates to inform decision-makers; or more to forward-looking forecasts of the future? The other is social – Do we look more to what other retirement systems are doing; or look more to what expert forecasters would expect for the System's own portfolio in the future?

Temporal**.** Looking backwards at historical rates of return and inflation is not considered to be reliable supporting documentation for current pension actuarial assumptions of future net returns and inflation. Historical rates of return and inflation are viewed more as mere information, than used to defend or determine a current net return or inflation assumption. The past is indeed useful for understanding historical relationships among various economic forces and various statistical metrics such as standard deviations, correlation coefficients and P/E ratios; but even those have been known to change over time and may be different from their historical averages.

The current domestic and global environment is not like the past 10, 30, or 50 years; and the future domestic and global environment is certain to be different from the past. The System's portfolio and its managers are not even the same now as they were in the past; nor will they be the same in the future as they are now.

A forward-looking perspective should drive the defense or determination of a net return or inflation assumption for pension actuarial valuations. Strategically selecting historical returns (an X-year period ending on Y-date) to justify a return assumption being applied to the next 10, 20, or 30 year period is not valid.

TRSL's historical returns have minimal relevance to us. We chose instead to develop our net return and inflation assumptions based on *forward-looking* forecasts from subject matter experts.

Social. Looking to what other peer retirement systems are doing is generally not a well-placed focus. Other retirement systems have their own asset allocation and expense structure and their own set of politics, protectionism, budget issues, and agency risk. They are not the best source to turn for validation of another system's return assumption. We prefer to set our return assumption from basic principles and the robust process described herein, rather than take comfort in what others in the crowd are doing.

While it may be interesting, even important, to know what investment return assumption is used by other large public sector retirement systems, that information is not useful for discharging our duties for adopting a net investment return assumption for the LLA's 2017 actuarial valuation of TRSL. It is not useful for actually informing us concerning the economic forecasts applicable to TRSL.

1. *Different environments*. Public retirement systems across the United States each have their own environmental challenges and sets of agency risk. Their assumption-setters may not have adhered to mainstream and objective forecasts of experts, but may have been influenced by budgets, protectionism and politics. These are not best qualities to be emulated when setting assumptions.

2. *Different asset allocations*. Other retirement systems are certain to have different asset allocation than TRSL, either more aggressive or less aggressive. That would make it a false comparison.

3. *Different horizon*. Other retirement systems may have been influenced by their consultants advocating a long-term horizon for the net investment return assumption. This is fairly common, but as discussed above, a mid-term horizon in more appropriate for the reasons stated.

Independent, unbiased, expert sources of inflation and investment return forecasts are the best places to look for input when setting a return assumption for pension valuations. These are much more objective and unfiltered sources, directly from the experts themselves, to guide decision-makers.

Adopting a *process* that looks to a consensus of external subject matter experts' forward-looking forecasts is the best way to avoid the political and budget pressures that sometimes distract or influence assumption-setters away from their primary duty to set return assumptions as their unbiased best estimate of the future earnings of the portfolio.

Horizon

Projecting pension costs is a long-term proposition. Forecasts of future inflation and future returns come in short-term horizons (1-5 years), mid-term horizons (5-20 years) and longest-term horizons (20-30 years). Long-term forecasts are appealing and tempting, being usually higher than mid-term horizon forecasts. While it may be argued that reliance should be placed on the longest-term horizons, there are at least four compelling reasons not to do so:

1. *Underperformance in the mid-term is not sustainable.* If the forecasting experts are right, there may be a decade or two of lower pension plan returns, with a need for very large returns thereafter.

   For example, in correspondence dated May 6, 2016, the U.S. Treasury Department denied the application of the Board of Trustees of the Central States, Southeast and Southwest Areas Pension Plan for rolling back benefits under the Multiemployer Pension Reform Plan Act of 2014 in order to avoid insolvency. One of the reasons given in the ruling[2] was that the 7.5% and other embedded return assumptions were "significantly optimistic" and were "not reasonable". More specifically, the ruling stated that the return assumptions used to the support the application were not reasonable or appropriate for the purpose of the measurement, did not take into account relevant current economic and investment forecast data, and had significant bias by being significantly optimistic. This three-fold denouncement was made primarily on the basis of the assumption's failure to recognize the lower expected returns in the first 10 to 20 years of the longer term horizon.

2. *The longest return horizon forecasts are the least reliable.* There is much less certainty in the longest-term forecasts. Conventional wisdom says that in the face of uncertainty, investors become more conservative. Thus, decision-makers should consider being more conservative than the longest-term forecasts because the longest-term forecasts are more uncertain. This is a principle in any forecasting profession, whether investment forecasting, election forecasting or hurricane forecasting. Long-term forecasts are less reliable than mid-term forecasts.

3. *Even though pensions are long-term propositions, we live in a short-term and mid-term world.* We should not need to wait 20 or 30 years to be vindicated for an assumption that we have so little confidence in anyway. In *The Tract on Monetary Reform (*1923), John Maynard Keynes said, "*But this long run is a misleading guide to current affairs. In the long run we are all dead. Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us that when the storm is past the ocean is flat again.*" Many financial economists, many in the press and many academics are calling for much lower investment return assumptions. The optics are not good for continuing to cling to a long-term horizon of 20-30^{+} years, when so many mid-term years are forecasted by the experts to be underperforming.

4. *The duration of the liabilities is approximately 14 years*. The "duration" of the liabilities is the average length of time until each future benefit payment. It can be thought of a weighted average length of time until benefits are paid, where each future year is weighted with the present value of that year's benefits. As of June 30, 2017, the duration of TRSL's future benefit stream is approximately 14 years.

   Therefore, approximately half the liability is expected to be paid in the first fourteen years. The assets used to pay those benefits do not have a chance to generate earnings in years 15 through 30 or more. This speaks to the preferable use of a mid-term horizon for the expected net return, rather than a 30-year horizon.

[2] https://www.treasury.gov/services/Responses2/Central%20States%20Notification%20Letter.pdf

Therefore, we have opted for a mid-term horizon for return forecasts.

Inflation Forecasts from Independent Experts

Expected rates of inflation are critical components of expected rates of return. We applied considerable care to obtain relevant research and opinions from inflation forecasting experts.

Average historical rates of inflation, such as the Consumer Price Index (CPI), over various time periods are relatively easy to calculate and readily available. Therefore, it is tempting to rely on historical rates when building up the net return forecasts.

However, there are many professional sources available to actuaries and investment consultants that forecast inflation on a forward-looking basis. In our opinion, as mentioned earlier, forward-looking forecasts are more appropriate than historical rates.

Currently, experts' forward-looking inflation forecasts generally lie between 1.73% and 2.60%. Consider the forward-looking forecasts from the following subject matter experts.

Eight Major National Inflation Forecasters	
Bond Investors	Congressional Budget Office
Federal Reserve Bank of Philadelphia	Federal Reserve Bank of Cleveland
Federal Reserve Board	GRS Survey
HAS Survey	Social Security Trustees Report

Some of them provide multiple measures of inflation for different time horizons, making a total of 19 forecasts from eight reputable sources.

2017 Measures of Inflation		
Horizon	**Average**	**Number of Sources**
26.3 - 30 yrs	2.20%	7
20 yrs	2.06%	3
9.40 -15 yrs	2.16%	9

Our preferred inflation assumption would currently be 2.25% because it lies more comfortably near a consensus of the expectations in the summary table above and the detailed table below (actually a little on the higher side). In our opinion, it would not be reasonable for us to select an assumed future inflation rate at the top end of 19 mid-term and long-term forecasts from inflation experts.

Consider the exhibit below, which shows inflation forecasts of these eight large reputable experts in the field of inflation forecasting.

Forward-looking Annual Inflation Forecasts (From Professional Experts in the Field of Forecasting Inflation)	
Federal Reserve Board's Federal Open Market Committee	
Current Long-run Price Inflation Objective (Since Jan 2012; Personal Consumer Expenditures)	2.00%
Congressional Budget Office: *The Budget and Economic Outlook*	
Overall Consumer Price Index (June 2017; Ultimate)	2.40%
Overall Consumer Price Index (June 2017; 11 Years)	2.36%
Personal Consumer Expenditures (June 2017; Ultimate)	2.00%
Personal Consumer Expenditures (June 2017; 11 Years)	1.98%
2017 Social Security Trustees Report	
CPI-W 15-Year Intermediate Assumption	2.60%
CPI-W 30-Year Intermediate Assumption	2.60%
GDP Deflator 15-Year Intermediate Assumption	2.20%
GDP Deflator 30-Year Intermediate Assumption	2.20%
Quarterly Survey of Professional Forecasters	
2Q2017 Federal Reserve Bank of Philadelphia 10-Year Forecast	2.30%
Federal Reserve Bank of Cleveland	
30-Year Expectation on June 1, 2017	2.13%
20-Year Expectation on June 1, 2017	1.97%
10-Year Expectation on June 1, 2017	1.73%
Bond Investors (Excess Yield of Non-indexed Treasuries Over Indexed Treasuries)	
30-Year Expectation on June 30, 2017	1.85%
Median 30-year Expectation over 6/30/12 - 6/30/17	2.09%
20-Year Expectation on June 30, 2017	1.77%
Median 20-year Expectation over 6/30/12 - 6/30/17	2.02%
10-Year Expectation on June 30, 2017	1.73%
Median 10-year Expectation over 6/30/12 - 6/30/17	1.96%
Investment Consultants and Forecasters	
2017 GRS Survey major national investment forecasters and consultants	
Median expectation among 8 firms (averaging 9.4 years)	2.25%
Median expectation among 4 firms (averaging 26.3 years)	2.21%
2017 HAS Survey of 12 investment advisors: Median (10 years)	2.32%
2017 HAS Survey of 12 investment advisors: Median (20 years)	2.44%

A supportable inflation assumption is a critical component for setting the net investment return assumption. In addition, the 2.25% inflation assumption also replaced the 2.50% inflation assumption built into TRSL's actuary's salary scale.

Asset Allocation

It has been generally accepted for many years that a fund's asset allocation is responsible for the vast majority of a fund's investment performance. Therefore, the asset allocation of the System is a core element in setting and evaluating the assumed future returns.

We relied on the 15 target asset allocation percentages set forth in the System's formal Investment Policy Statement last updated in June 2017.

2017 TRSL Target Asset Allocation			
Risk Assets		**Fixed Income Assets**	
Large U.S. Equity	20.0%	Core U.S. Fixed Income (Market Duration)	9.0%
Small Cap U.S. Equity	5.0%	High Yield Bonds	4.0%
International (Non-US) Equity (Developed)	11.0%	Non-US Developed Bond (0% Hedged)	2.0%
Emerging Markets Equity	8.0%	Emerging Market Bonds (Soc. Local)	3.5%
Private Real Estate (Core)	5.0%		
Private Real Estate (Non-Core)	5.0%		*18.5%*
U.S. REITS	2.0%		
Private Equity	22.0%		
Infrastructure	1.5%		
Commodities	1.0%		
Farmland - Row Crops	1.0%		
Total Risk Assets	*81.5%*	*Total Asset Allocation*	*100.0%*

Source: Current TRSL Investment Policy Statement (dated June 23, 2017)

TRSL's asset allocation is somewhat riskier than other pension funds; but it is, therefore, expected to earn somewhat more than others with more conservative portfolios. As a result, TRSL's expected rate of return *should* be greater than other retirement systems with lowers allocations to risk assets.

Investment Return Forecasts from Independent Experts

We applied the target asset allocations to the expectations in the GRS Survey of 10 major national investment consultants and forecasters. Eight of these 10 investment consultants/forecasters provided GRS with their mid-term (10 years) horizon forecasts, and four of them provided GRS

with their longer-term (20 to 30 years) horizon forecasts. Given the brevity of the descriptions of the asset classes identified, our mapping of these 15 asset classes to the investment consultant's asset classes may not be exact.

Listed below are the national firms in our 2017 GRS Survey. These are very large and reputable investment consultants and forecasters.

Eight Major National Investment Consultants and Forecasters		
BNY/Mellon*	J. P. Morgan*	Marquette Asscoiates
Mercer*	NEPC *	Pension Consulting Alliance*
Principal	Voya	

**Each firm has between $1 trillion and $10 trillion in worldwide assets under management or advisement; the others are large managers and advisors below $1 trillion.*

We applied the investment forecasters' expected returns to TRSL's asset allocation. We replaced the investment forecasters' respective inflation assumptions with 2.25%, our preferred assumption based on the consensus of expert inflation forecasters' expectations presented above in order to normalize for a consistent inflation assumption across all forecasters.

We reduced the respective forecasts for TRSL by the expected investment-related expenses and added alpha back in to replace active management expenses above expected passive management expenses, as permitted and limited by ASOP No. 27. This leaves a net reduction estimated to be for passive investments.

This process results in normalized expected returns for any one given year in the forecast horizon (called the expected arithmetic return). Finally, we reduced the resultant one-year arithmetic returns for volatility drag in the compound return expected over time, because pensions are all about compounding in a volatile environment over the horizon.

Below are the results of this process for the mid-term horizon.

Investment Consultant 10 Year Horizon	Distribution of 10-Year Average Geometric-Compound Net Nominal Return (Percentiles) 40th	50th	60th	Probability of exceeding 8.20%
(1)	(2)	(3)	(4)	(5)
1	4.72%	5.79%	6.86%	28.64%
2	5.45%	6.46%	7.48%	33.27%
3	5.06%	6.25%	7.46%	34.19%
4	5.78%	6.77%	7.77%	35.89%
5	5.44%	6.58%	7.72%	36.04%
6	5.61%	6.82%	8.05%	38.79%
7	5.97%	7.21%	8.46%	42.02%
8	7.13%	8.04%	8.95%	48.18%
Average	**5.64%**	**6.74%**	**7.84%**	**37.13%**

There are three important takeaways from this exhibit:

a. Over the mid-term horizon the range of expert expectations of the 50th percentile of compound average return runs from 5.79% to 8.04%.

b. The 50th percentile consensus expert mid-term forecast is 6.74%, or rounded to 6.75%.

c. The consensus of these experts is that there is only a 37.13% chance of achieving at least the current 8.20% over the mid-term horizon. This does not mean a 37.13% chance of achieving the 8.20% assumption in any year during the horizon; it means that the compound return over the next 10 years has a 37.13% of achieving at least the 8.20% assumption.

This is why, actuarially speaking, the 6.74% rate of return is the preferred assumption for funding because it is the 50th percentile expectation of compound returns over a mid-term horizon. The consensus is that there is a 50-50 chance of returning at least 6.74% when compounded over the next 10 years.

Below are the results of this process for the long-term horizon.

Investment Consultant 20-30 Year Horizon	Distribution of 25-Year Average Geometric-Compound Net Nominal Return (Percentiles)			Probability of exceeding
	40th	50th	60th	8.20%
(1)	(2)	(3)	(4)	(5)
1	6.13%	6.75%	7.38%	27.98%
2	6.34%	7.06%	7.79%	34.60%
3	6.58%	7.31%	8.04%	37.92%
4	6.93%	7.71%	8.50%	43.77%
Average	**6.49%**	**7.21%**	**7.93%**	**36.07%**

There are three important takeaways from this exhibit:

a. Over the long-term horizon the range of expert expectations of the 50th percentile of compound average return runs from 6.75% to 7.71%.

b. The 50th percentile expectation of the consensus average for the long-term horizon is 7.21%.

c. The consensus of these experts is that there is only a 36.07% chance of achieving at least the current 8.20% over the long-term horizon. This does not mean a 36.07% chance of achieving the 8.20% assumption in any year during the horizon; it means the compound return over the next 25 years has a 36.07% of achieving at least the 8.20% assumption.

For use in a pension actuarial valuation, where the entire measurement and funding model is built on compounding (present values and future values), the 50th percentile compound or geometric expectation over a mid-term horizon are the most appropriate choices of a return assumption.

Consensus of Multiple Independent Experts

Rather than rely on just one or two experts, we follow conventional wisdom and track the consensus (average) of the expert forecasts.

It matters not whether the field of forecasting is for hurricanes, earthquakes, elections, or inflation and investment returns, a *consensus average* of many reputable experts is proven to be more accurate than any one of those experts.

This ensures we are in the mainstream consensus of reputable national experts.

APPENDIX D
BASIS FOR TREATMENT OF ADMINISTRATIVE EXPENSES

Appendix D: Basis for Treatment of Administrative Expenses

As mentioned in the Summary and Conclusions of this actuarial report, currently, TRSL recognizes the cost of paying administrative expenses required to deliver plan benefits by reducing the net investment return assumption by 10 basis points (i.e., 0.10% of plan assets). For the purpose of disclosing the June 30, 2017 unfunded actuarial liability and re-calculating the contribution rate for the year ending June 30, 2018, we retained this treatment.

Act 94 of 2016 requires that the expected noninvestment-related administrative expenses for the contribution year be included in the actuarially required employer contribution beginning with the first fiscal year in which the projected aggregate employer contribution rate, calculated without regard to any changes in the board-approved actuarial valuation rate, will not increase. That threshold was satisfied for the contribution year ending June 30, 2019.

We applied this direct explicit method to the determination of the contribution rate for the year ending June 30, 2019. We used a 0.45% of pay load on the normal cost to fund for administrative expenses The table below supports the selection of 0.45% of covered payroll as reasonable approximation.

Appendix D: Basis for Treatment of Administrative Expenses

Administrative Expenses (for Year Ending June 30)	2010	2011	2012	2013	2014*	2015*	2016*	2017*
General Administrative Expenses	16,154,823	15,417,596	16,317,659	15,750,180	15,026,969	14,259,428	14,532,681	14,368,886
As a Percent of Expected Covered Payroll	0.41%	0.40%	0.43%	0.42%	0.40%	0.37%	0.38%	0.37%
Other Post-Employment Benefits Expense	1,813,334	1,477,395	1,050,097	974,145	1,047,832	3,764,366	2,492,633	3,393,246
Depreciation and Amortization Expense	543,096	537,060	440,291	377,150	322,881	384,426	407,105	3,432,238
Total Administrative Expenses	18,511,253	17,432,051	17,808,047	17,101,475	16,397,682	18,408,220	17,432,419	21,194,370
As a Percent of Expected Covered Payroll	0.47%	0.45%	0.47%	0.46%	0.44%	0.48%	0.45%	0.54%
As a Percent of Beginning Market Value	0.16%	0.15%	0.12%	0.12%	0.11%	0.10%	0.10%	0.12%
Expected Covered Payroll for the Year	3,977,819,262	3,902,646,534	3,808,760,594	3,726,325,750	3,764,954,727	3,815,648,662	3,869,730,024	3,901,627,792
Beginning Market Value of Total Fund	11,250,281,297	12,021,431,384	14,577,210,581	14,188,983,721	15,490,236,860	17,886,838,190	17,896,379,678	17,537,950,955

Source: TRSL Comprehensive Annual Financial Statements

* General Administrative Expenses exclude investment-related Administrative Expenses for 2014 and later.

APPENDIX E
BASIS FOR TREATMENT OF GAIN-SHARING COST-OF-LIVING BENEFITS

Appendix E: Basis for Treatment of Gain-Sharing

TRSL's retirees are likely to receive future cost-of-living (COLA) benefit increases with some regularity. This likelihood comes from the workings of the relevant state statutes coupled with the tendency and history of Legislators voting to grant COLAs whenever allowed in accordance with the statutory template. A notional Experience Account is maintained to hold funds which ultimately are used to provide COLA benefits. The Experience Account is replenished with investment gains that exceed certain thresholds, subject to a series of complex formulas and rules set forth in the statutes. We call this type of COLA provision a gain-sharing COLA.

The mathematical and logical rules set forth in the statutory template lend themselves to actuarial modeling. The frequency and magnitude of the future transfers to the Experience Account can be modelled actuarially using well-accepted techniques. Given the presumption that Legislators will grant a template COLA whenever allowed by the statutes, it is actuarial appropriate to recognize the frequency and magnitude of future COLAs when performing an annual actuarial valuation of the System's costs and liabilities.

The TRSL's board and actuary have included the value of future COLAs, as described above, in each of the last several annual funding valuations. We concur that it is essential to recognize the costs and liabilities of future COLAs in all actuarial valuations, and have done so in this valuation.

We have seen three actuarial methods employed to measure the costs and liabilities of future COLAs, all of which require stochastic modeling techniques to simulate the operation of the statutory mechanism. The statutory COLA provisions applicable to TRSL are complex, but can be modelled actuarially. Each actuarial method involves an estimate of one statistic or another, which should be re-calculated every few years unless something changes or the actuarial programming is improved. Nevertheless, as with all assumptions, it should be reviewed every year for reasonableness.

The three actuarial methods are described below, along with our rationale for why we employed the third one in this actuarial valuation rather than either of the first two.

1. The first actuarial method is an implicit recognition of future COLAs by *reducing the return assumption* by an annual amount expected (on average) to be syphoned off from the core pension fund and transferred to the Experience Account. This is the least preferable because:

    a. It creates a confusing difference between the return assumption and discount rate,

    b. It is not permitted for GASB financial reporting,

    c. It is not fully transparent in isolating the stream of COLA benefits,

    d. The implicit approach is out of favor among actuaries, and

    e. It causes some confusion and interpretive questions when applying the statutory rules and determining the actuarial gains and losses in connection with the use of a return assumption, the board-approved valuation rate and/or the discount rate.

2. The second actuarial method is more explicit and *adds a load* to the benefit stream to approximate the effect of granting future COLAs. This load is added to the normal cost and actuarial accrued liability as an estimate of the additional benefits generated by the workings of the COLA provisions (after transfers to the Experience Account and after approvals of permanent benefit increases). This is preferable to the first method because it leaves the return assumption equal to the discount rate. However, it lacks additional management information available under the third actuarial method.

3. The third actuarial method is also the most explicit and transparent of the three actuarial methods. It determines a *single equivalent annual COLA* benefit which is calculated as equivalent to the stochastically modelled statutory template (after transfers to the Experience Account and after approvals of permanent benefit increases).

   It substitutes an assumed annual COLA to measure the plan's future costs and liabilities. It is only hypothetically applied annually, in the actuarial valuation as an approximation of the actual COLA provisions.

   a. This is preferable to the first method because it leaves the return assumption equal to the discount rate, thereby avoiding a lot of confusion.

   b. It is preferable to the first two methods because it gives management of the System and Legislators an idea of how much of an annual COLA is equivalent to the statutory template.

   c. It is preferable to the first two methods because the statistic being estimated is not a number of investment basis point earnings, nor a load factor, but an equivalent annual COLA – the very thing that is being promised in the statutes.

   d. It is useful information for members who want a rough equivalent annual COLA value. We do not believe use of this actuarial estimate or assumption in the annual actuarial valuation will automatically give members an expectation of an annual COLA. The statutes prevail; and knowledgeable parties should understand that COLAs are not allowed to be granted annually until the funded status reaches a higher level. This is just an estimated equivalency.

Modeling results for the third actuarial method

The third actuarial method projects the expected streams of future gain-sharing transfers into the Experience Account using the investment-related assumptions adopted by the LLA's actuary. This explicit model stochastically generated net investment returns for the next 30 years, and did so 500 times (i.e., 500 trials). This means that 15,000 annual rates of return (single year rates) were randomly selected from a lognormal distribution with mean of 7.63% and standard deviation of 13.90% to simulate the operation of TRSL's complex gain-sharing COLA program. The mean and standard deviation are the average (consensus) of the eight major national investment forecasters in the GRS Survey. The mean is not the expected compound return over time, which is much lower (6.75%) and more appropriate for actuarial valuations.

The model applied the various internal statutory rules and limitations on the amounts that might be transferred to the experience account. It assumes that every year for which the statutes permit a permanent benefit increase to be granted, it will be granted and will be the maximum allowed. There is substantial evidence for this assumption from both historical statistics and behavioral expectations.

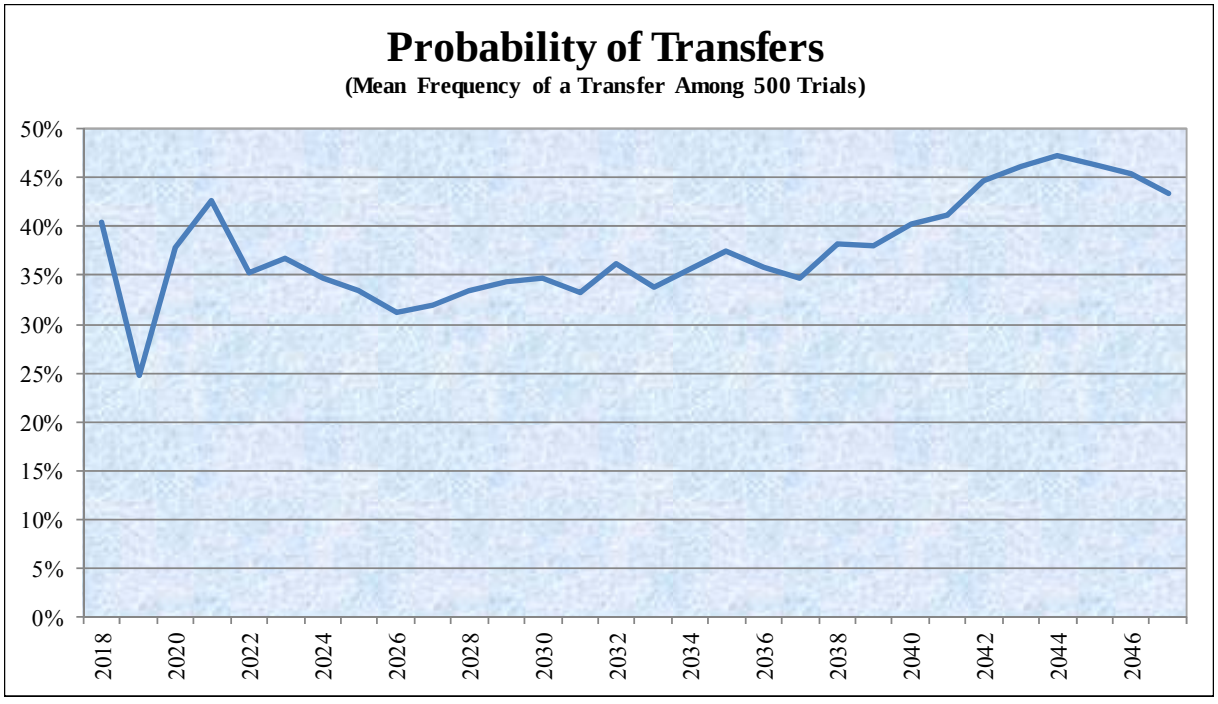
The model built for this purpose includes the following primary steps, as well as numerous other intermediary tests and calculations:

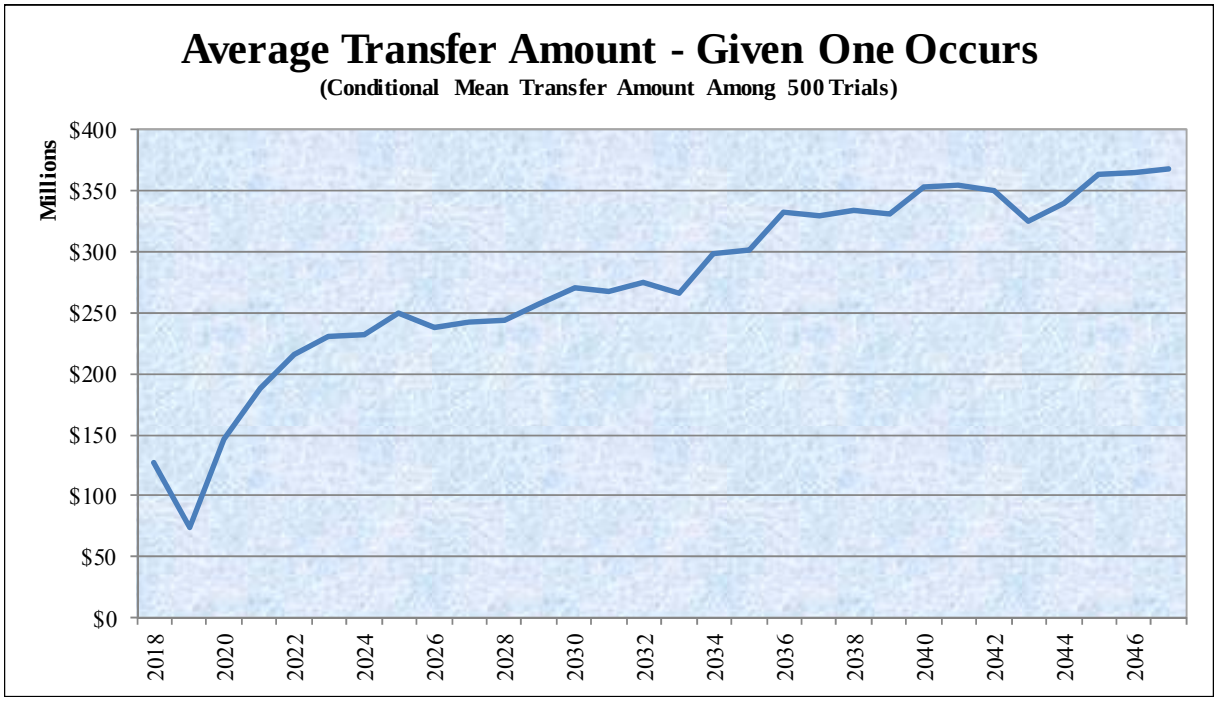
1. Modeling future new hires and future actuarial valuations,
2. Modeling the markets and future rates of return using generally acceptable techniques,
3. Modeling the actuarial rate of return,
4. Modeling the dollar hurdle,
5. Modeling the limitations on the experience account,
6. Modeling the restrictions on the permanent benefit increase, and
7. Modeling the amount of the permanent benefit increase.

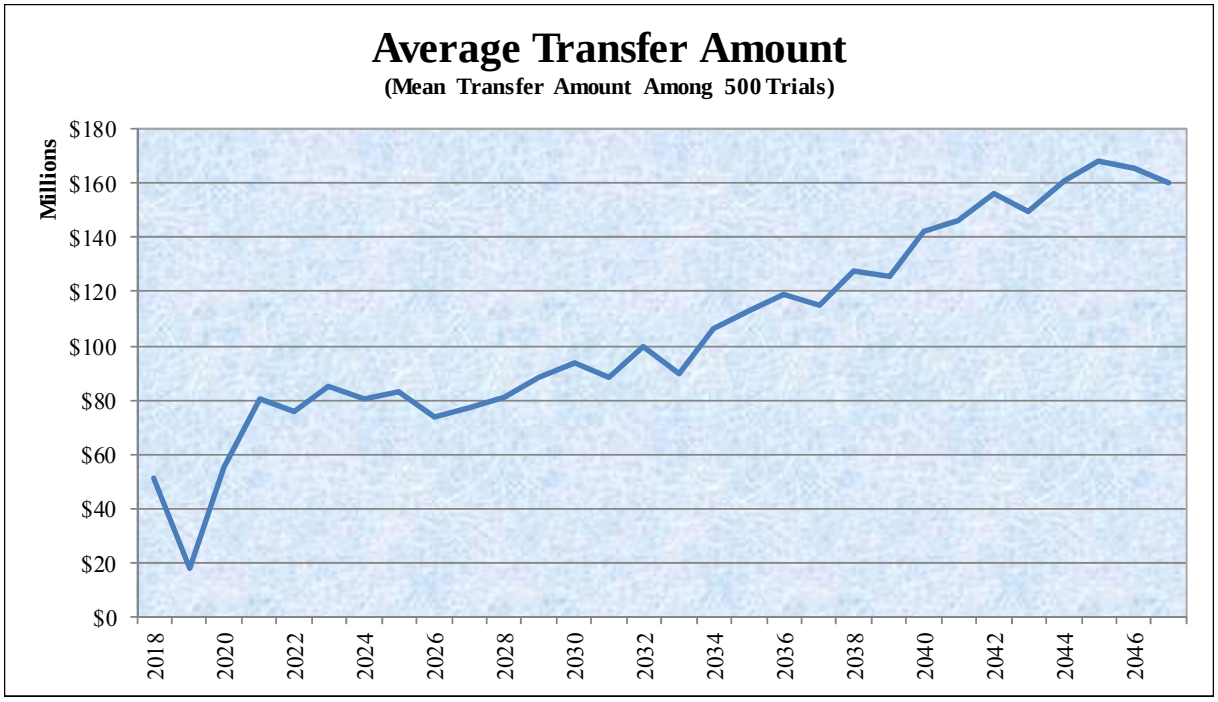
In some years, the model expects a transfer to the Experience Account and in some years expects none. For each year in which the model expects a transfer, the amount can vary widely.

The mean (average) amount expected to be transferred to the Experience Account each year was captured and their present value calculated. It was determined that a 0.50% annual cost-of-living increase (COLA) would produce the same additional present value. This is the same results obtained last year. It is, therefore, considered the single equivalent COLA that approximates the working of the statutory gain-sharing mechanism.

Consider the following graphs illustrating the results (Experience Account transfers) of the simulations in the stochastic model of TRSL's gain-sharing COLA program.




Average Transfer Amount - Given One Occurs
(Conditional Mean Transfer Amount Among 500 Trials)
Millions
$400
$350
$300
$250
$200
$150
$100
$50
$0
2018
2020
2022
2024
2026
2028
2030
2032
2034
2036
2038
2040
2042
2044
2046


Average Transfer Amount
(Mean Transfer Amount Among 500 Trials)
Millions
$180
$160
$140
$120
$100
$80
$60
$40
$20
$0
2018
2020
2022
2024
2026
2028
2030
2032
2034
2036
2038
2040
2042
2044
2046