2016 ACTUARIAL VALUATION REPORT ON THE TEACHERS' RETIREMENT SYSTEM OF LOUISIANA

ACTUARIAL VALUATION AS OF
JUNE 30, 2016
ISSUED NOVEMBER 28, 2016

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2016 ACTUARIAL VALUATION REPORT

TEACHERS' RETIREMENT SYSTEM OF LOUISIANA

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LOUISIANA LEGISLATIVE AUDITOR
DARYL G. PURPERA, CPA, CFE

November 28, 2016

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 prepared for the Teachers' Retirement System of Louisiana as of June 30, 2016, by the actuary of the Legislative Auditor, as required under R.S. 11:127(C).

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

Sincerely,

Daryl G. Purpera, CPA, CFE
Legislative Auditor

DGP:PTR:ch

TRSL 2016 VALUATION

SUMMARY AND CONCLUSIONS

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2016 Valuation Report on the Teachers' Retirement System of Louisiana

This valuation has been prepared as of June 30, 2016, 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, 2016.

2. Determine the actuarially calculated employer contribution requirement for FYE 2017.

3. Determine the sources and amounts of gains and losses between June 30, 2015, and June 30, 2016.

4. Calculate projected employer contribution rates for FYE 2018.

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

The actuary for the Louisiana Legislative Auditor (LLA) is 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.*

The actuarial valuation report for TRSL prepared by the LLA serves two purposes:

1. To provide PRSAC with assurance that actuarial mathematics, benefit formulas, and actuarial assumptions for the June 30, 2016 valuation were applied correctly, and

2. To provide PRSAC with a second opinion in regard to the assumptions and methods used to value assets, liabilities, employer contribution requirements, and the funded ratio.

As a result of his work, the LLA's actuary has reached the following conclusions:

1. When using the same methods and assumptions, the LLA and TRSL actuaries will obtain identical results.

2. In his August 2015 presentation to the Public Retirement Systems' Actuarial Committee on the sustainability of the Louisiana Retirement Systems, the LLA actuary identified the following risks:

    a. The retirement system cannot invest its way out of the unfunded accrued liability hole; contributions toward the unfunded accrued liability are necessary.

    b. Employer contributions toward the unfunded accrued liability may need to be larger than current levels because of market volatility.

    c. Assumptions and methods must be continuously monitored to keep additional unfunded liabilities from developing.

3. The LLA's actuary cannot, for the employer contribution for FYE 2018, support, endorse, or certify the following assumptions and methods used by the TRSL's actuary:

    a. Mortality Tables,

    b. Investment Return, Inflation and the Discount Rate assumptions,

    c. Treatment of Administrative Expenses, and

    d. Treatment of Gain-sharing COLA benefits.

    Therefore, the LLA's actuary is required by Actuarial Standards of Practice to use assumptions and methods that he can support, endorse and certify.

The LLA actuary evaluated the reasonable range for these four assumptions. 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

The LLA's actuary revised the mortality tables used in this valuation (for the employer contribution for FYE 2018), in order to make use of more current 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. The results of the experience study were not quantitatively reflected in the mortality recommendations at that time. For this actuarial valuation (specifically, for employer contribution rates for FYE 2018), the LLA's actuary chose to reflect the actual mortality experience exhibited by the TRSL's active and retiree population directly into the mortality tables, as was done by TRSL's actuary in developing the turnover tables.

This is accomplished by multiplying each entry in a set of published reference tables by TRSL-

derived mortality experience factors. The TRSL experience study report presented results broken out by active employees and retirees (and beneficiaries) and by males and females. Therefore, there are four TRSL-derived experience factors applied to each of the respective reference tables.

This method of applying TRSL-derived experience factors to reference tables is the generally accepted method in actuarial practice for reflecting the mortality experience; to the extent the groups are large enough to provide "credible" data. For groups that are not "fully credible," standard adjustments are made to partially reflect the group's experience.

The most recently published set of reference tables is called RP-2014, which includes various types of tables such as for actives and retirees and for males and females. These tables and the predecessor tables (RP-2000) were developed by the Society of Actuaries' Retirement Plans Experience Committee (RPEC) and in the opinion of the LLA actuary are widely accepted as the best and most recent mortality tables for use in pension actuarial valuations. RP-2014 (published in 2014) and its associated mortality improvement scale replaced RP-2000 as being the most recent and reliable mortality tables for retirement plan valuations.

In the opinion of the LLA actuary, it is generally accepted among actuaries, demographers and the medical profession that mortality rates will continue to improve in the future (i.e., longer life expectancies in future years). The current and most appropriate treatment for reflecting a prudent level of future mortality improvements is to apply the improvement scales also developed and recommended by RPEC. The most recently published mortality improvement scale is called MP2016.

The LLA's actuary recognizes the experience studies for larger systems are generally performed every five years and the next one for TRSL is not scheduled until 2018. However, in the opinion of the LLA actuary, 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, Actuarial Standard of Practice (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. The LLA's actuary believes this new approach satisfies that standard.

Developing TRSL-derived experience factors, applying them to RP-2014 mortality tables, and then applying the MP-2016 improvement scale (published in 2016) are simple processes, not requiring significant efforts. Considering the improvement in actuarial accuracy and compliance with ASOP No. 35, the benefits obtained for applying this simple process outweigh the minor additional costs.

The table on page 8 presents the effect of this mortality change (as well as others) on the unfunded accrued liability and the employer contribution rate for FYE 2018. Basically, employees and retirees are living longer and that will cost more; so the LLA's actuary reflects that in the actuarial

calculations herein. For more details on how this new mortality assumption was developed and its prudence, refer to Appendix B.

Investment Return, Inflation and Discount Rate

TRSL's discount rate is 7.75% (before the reduction to 7.70% for determining the employer contribution rate for FYE 2018). TRSL's actuarial valuation report (prepared by Foster and Foster) and TRSL's Comprehensive Annual Financial Report state that the discount rate is already net of investment expenses, net of administrative expenses (10 basis points), and net of expected transfers to the experience account (25 basis points). Page 5 of the Foster and Foster valuation report discloses the investment return assumption (net of investment expenses) to be 8.10%. By adding the 10 basis points and the 25 basis points back on top the 7.75% discount rate, that TRSL's investment return assumption can be derived to be 8.10%.

The 8.10% is the net return (after investment-related expense) that TRSL assumes it will earn on its portfolio. As stated in Foster and Foster's report, if the 10 basis points and the 25 basis points are subtracted from the 8.10%, the final discount rate of 7.75% is obtained for use in the actuarial valuation.

Based on the research conducted by the LLA's actuary and Gabriel, Roeder, Smith & Company Holdings, LLC (GRS), a more appropriate and mainstream assumption for the net investment return on its portfolio would be 7.00% (without any further reductions for administrative expenses and experience account transfers). For more details on how the 7.00% was determined and its prudence, refer to Appendix C.

The TRSL report states that the inflation rate assumption is 2.50%. As part of the building block approach to developing the 7.00% stated above, the LLA's actuary assumes the most appropriate choice for the inflation rate to be 2.25%. The same method was used for inflation as it pertains to the salary scale. Again, for more details on how the 2.25% was determined and its prudence, refer to Appendix C.

In the interest of transparency, the LLA's actuary treats the discount rate as equal to the net investment return assumption in his actuarial valuation for determining the employer contribution for FYE 2018. No further reductions to the 7.00% are made for administrative expenses or for experience account transfers. The costs of those plan outflows are more transparently recognized in an explicit manner, as described below.

The table on page 8 presents the effect of the net investment return change (as well as others) on the unfunded accrued liability and the employer contribution rate for FYE 2018. Basically, a consensus of eight major national investment forecasters expects TRSL's investment portfolio to earn substantially less over the next 10-20 years than the 8.10% being assumed. Therefore, the costs and liabilities to the taxpayers being measured in this valuation are greater than those being measured by Foster and Foster. The building block components of the discount rate and total rate

of return on investments are summarized below.

Assumption	**LLA's Actuary**	**TRSL's Actuary**
Real Rate of Return on Investments	4.75%	5.60%
Rate of Inflation	2.25%	2.50%
Total Rate of Return on Investments	7.00%	8.10%
Rate of Return Diverted to Pay for Administrative Expenses	N/A	0.10%
Rate of Return Diverted to Pay for the Gain Sharing/COLA	N/A	0.25%
Discount Rate	7.00%	7.75%

Treatment of Administrative Expenses

Currently, TRSL recognizes the cost of paying administrative expenses necessary to deliver plan benefits by reducing the net investment return assumption by 10 basis points (i.e., 0.10% of plan assets). This is a reasonable estimate for the current year. However, this approach slightly overstates the cost of administrative expenses in future years because plan assets are expected to grow faster than administrative expenses. For example, seven years ago, actual administrative expenses were approximately 0.16% of plan assets; but as plan assets have grown, administrative expenses have not grown as fast. The ratio is currently less than 10%. Furthermore, this approach is not consistent with the GASB's requirements for financial reporting.

A more transparent and consistent approach for recognizing the cost of administrative expenses required to deliver plan benefits is to add a load onto the normal cost equal to an estimated percentage of covered payroll, which is a better reference base than plan assets. For the last seven years, actual administrative expenses have remained between 0.44% and 0.47% of covered payroll. Therefore, the LLA's actuary has used a normal cost load of 0.46% of covered payroll to fund expected administrative expense outflows.

The LLA's actuary believes this more transparent and consistent approach does not violate the statutes. The language in R.S. 11.102(B)(3) leaves implied room for a load on the normal cost to account for the administrative cost of delivering the benefits.

For more details on how the 0.46% was determined and the rationale for this more-transparent and consistent approach, refer to Appendix D.

Treatment of Gain-sharing COLA Benefits

Currently, TRSL recognizes the cost of gain-sharing cost-of-living adjustments (COLAs) by reducing the net investment return assumption by 25 basis points (0.25% of plan assets). This method is an implicit, non-transparent method for pre-funding the cost of the system's COLA benefit provisions.

A more explicit and transparent method would be to estimate (through stochastic modelling techniques) an equivalent single and uniform annual COLA increase, and measure that in the

actuarial valuation. In the opinion of the LLA's actuary, the current implicit approach has several deficiencies in operation which are rectified by this more explicit and transparent approach.

1. The current implicit approach obscures the true underlying net return assumption. For transparency and comparability to other systems, the 8.10% is the true net investment return assumption. However, because the 7.75% is the rate that is publicly disclosed, it is understood by users of financial statements and the public in general to be the net investment return assumption when it is not. A more transparent approach would be for the net long-term return assumption to be the same as the discount rate.

2. The current implicit approach is specifically prohibited by the GASB for Statement No. 68 purposes for the June 30, 2016 measurement date (employer reporting year) and specifically prohibited for GASB No. 67 purposes for FYE June 30, 2017 the plan's reporting year. Therefore, a move to an explicit approach for funding would keep the two valuations (funding and accounting) consistent with each other.

   As mentioned previously, the current implicit approach for measuring the cost of administrative expenses is also specifically prohibited by the GASB.

3. The current implicit approach creates confusion and double-counting when applying the statutory template mechanism for determining the amount of an experience account transfer. Making 7.75% the hurdle for experience account transfers is a form of double-counting. It is already reduced by 0.25% for COLAs (and by 0.10% for administrative expenses), which makes it easier for experience account transfers to occur by measuring returns against a lower bar and is not entirely consistent with the statutory language for calculating experience account transfers.

4. The current implicit approach inhibits the measurement of the effect of legislative bills that may alter the triggers, hurdles and other formulas in the statutory template that determine (a) whether and how much is transferred to the experience account, (b) whether and when a permanent benefit increase may be granted and (c) who is eligible for such a permanent benefit increase. The explicit approach provides the actuary with a better understanding of the inner workings and interactions of all the moving parts of the gain-sharing program. The explicit approach allows for easier measurement of the effect of such legislative proposals.

5. The current implicit approach gives no useful information concerning how much the current complex gain-sharing structure is expected to provide in terms of a fixed annual or biennial COLA increase. The explicit approach does so naturally.

6. The current implicit approach is much more difficult and even contradictory in separately isolating (a) the actuarial gain or loss arising due to investment earnings from (b) an actuarial gain or loss due to a permanent benefit increase granted or not and (c) whether or not an experience account transfer is to occur in the coming year.

7. The explicit approach is more consistent with modern financial engineering methodologies and the growing actuarial momentum for measuring complex benefit provisions in pension plans. This implicit approach is fast becoming obsolete, supplanted by more explicit approaches.

8. In order to estimate the amount (in basis points) by which to reduce the investment return assumption to account for gain-sharing COLAs, a full stochastic model should be built and run anyway. Without building a full model for TRSL's complex gain-sharing structure, it is just guessing (or using a flawed historical analysis). Building a full model for TRSL's complex gain sharing structure allows the LLA actuary to put greater emphasis on forward looking analysis. The current TRSL method puts too much emphasis on historical analysis that is not necessarily relevant for the future. So as long as the full model needs to be built and run any way, the LLA's actuary chose to use the output in an explicit form.

By modelling the statutory template mechanism using the economic assumptions from eight major national investment forecasters (the same basis for developing the 7.00% net return assumption for valuation purposes), the LLA's actuary and GRS determined that a 0.5% annual COLA benefit approximates the 50th percentile expectation of future experience account transfers over the next 30 years. In other words, an annual COLA grant of 0.50% has a present value that is equal to the present value of COLA benefits to be granted in accordance with the current law.

Therefore, the final determination of employer contribution requirements for FYE 2018 presented herein was developed using an annual net return assumption (and discount rate) of 7.00% and a single equivalent COLA increase of 0.5% per year.

For more details on how the 0.5% was determined and the prudence of the explicit approach, refer to Appendix E

The Effect of New Assumptions and Methods

The table on the following page presents employer contribution requirements for FYE 2018 and the unfunded accrued liability projected to June 30, 2017 associated with each of the four new assumptions/methods described above. 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.

The reader of this report should recognize that the LLA's actuary is not making any judgement about whether the TRSL's actuary is complying or not complying with Actuarial Standards of Practice. Professional actuarial opinions may differ and with both opinions being in compliance with Actuarial Standards of Practice.

The reader of this report should also recognize:

1. The two actuaries might select the same assumption set if the range of reasonableness of the LLA's actuary and the range of reasonableness of the TRSL's actuary overlap.

2. The assumption set used by the LLA's actuary is based on the analysis described in Appendix C, which reflects the consensus of forward-looking expectations by the leading

investment consultants providing services to public sector retirement systems.

The following table illustrates effects of implementing assumptions described on the previous pages. Although, TRSL proposed to change the discount rate from 7.75% to 7.70% (and the net return assumption from 8.10% to 8.05%) for use in employer contribution rates for FYE 2018 and for the measurement of the unfunded accrued liability as projected to June 30, 2017, the LLA actuary's report does not include any calculations of costs and liabilities using 7.70% discount rate (or 8.05% net investment return assumption) because new assumptions for the net investment return (and therefore the discount rate) are employed in this actuarial valuation report.

The Effects of Changes in Assumptions and Methods	**Unfunded Accrued Liability** Projected to 6/30/17 ($ Millions)	**Employer Contribution Rate** Projected for FYE 2018 (as Pct of Projected Covered Pay)
(1) Without Any Changes in Assumptions or Methods *(benchmark values)*	10,877.0	26.1%
(2) Change in Mortality Table *(effect of change in Mortality table against benchmark)*	11,995.7	28.6%
a. Effect of the Change: (2)-(1)	1,118.7	2.5%
(3) New Investment Return Assumption *(effect of changes to the Mortality Table and Investment Rate Assumption against benchmark)*	15,411.7	36.1%
a. Effect of this Additional Change: (3)-(2)	3,416.0	7.5%
(4) New Treatment of Administrative Expense *(effect of changes to the Mortality Table, Investment Rate Assumption, and New Treatment of Administrative Expenses against benchmark)*	15,079.9	35.8%
a. Effect of this Additional Change: (4)-(3)	(331.8)	-0.3%
(5) New Treatment of Gain-sharing COLA Benefits *(effect of changes to the Mortality Table, Investment Rate Assumption, New Treatment of Administrative Expense, and New Treatment of Gain-sharing COLA against benchmark)*	15,598.0	36.7%
a. Effect of this Additional Change: (5)-(4)	518.1	0.9%
b. Effect of All four Changes: 2a+3a+4a+5a = (5)-(1)	4,721.0	10.6%

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

(3) Change in net investment return assumption from TRSL's 8.10% (not to be confused with TRSL's 7.75% discount rate) to LLA's 7.00% net investment return assumption

(4) Change in administrative expenses from TRSL's implicit reduction of net return assumption (down by 0.10%) to LLA's explicit normal cost load (of 0.46% of covered payroll)

(5) Change in gain-sharing COLA increases from TRSL's implicit reduction of net return assumption (down by 0.25%) to LLA's explicit single equivalent annual 0.5% COLA

The assumption sets shown above reflect the different professional opinions of the two actuaries preparing the same work product.

Public Document

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

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.

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

			----------Prior Years----------	
		June 30, 2016	**June 30, 2015**	**June 30, 2014**
A.	**Membership Data**			
	(1) Retirees	75,828	75,259	73,195
	(2) Actives	84,068	83,602	82,886
	(3) DROP	2,504	2,283	2,291
	(4) Terminated Vested	6,687	6,606	6,336
B.	**Annual Benefits**	$ 1,887,454,080	$ 1,820,201,496	$ 1,744,088,016
C.	**Total Payroll**	3,869,730,024	3,815,649,662	3,764,954,727
D.	**Valuation Assets**	18,254,321,142	17,457,243,695	16,145,772,807
E.	**Experience Account**	24,977,477	226,356,559	218,148,161
F.	**Investment Returns**			
	(1) Market (Total Assets)	1.02%	2.52%	18.44%
	(2) Market (excl. OPR & self-directed)	1.04%	2.58%	18.90%
	(3) Net Actuarial Value	6.67%	11.26%	13.14%
	(4) Rate for DROP Accounts	6.17%	10.76%	12.64%
G.	**Normal Costs**			
	(1) Total in Dollars	$ 466,591,480	$ 463,783,246	$ 459,658,120
	(2) Total Normal Cost Rate	12.06%	12.15%	12.21%
	(3) Employer Normal Cost Rate	4.07%	4.17%	4.23%
H.	**Accrued Liability**	$ 29,272,401,978	$28,646,296,897	$ 28,119,536,564
I.	**Unfunded Accrued Liability**	$ 11,018,080,836	$11,189,053,202	$ 11,973,763,757
J.	**Funded Percentage**	62.4%	60.9%	57.4%
K.	**Funding Requirements for the Fiscal Year Following the Valuation Date**			
	(1) Employees			
	a) Contributions	$ 314,144,962	$ 310,329,613	$ 306,132,676
	b) Rate	7.98%	7.98%	7.98%
	(2) Employers			
	a) Contributions	$ 1,137,650,159	$ 1,125,847,380	$ 1,158,523,507
	b) Rate	25.80%	25.80%	27.00%
L.	**Funding Requirements for the Subsequent Fiscal Year**			
	(1) Employees			
	a) Contributions	$ 323,541,841	$ 320,647,506	$ 316,264,891
	b) Rate	7.98%	7.98%	7.98%
	(2) Employers			
	a) Contributions	$ 1,659,100,736	$ 1,229,229,363	$ 1,162,619,515
	b) Rate	36.70%	27.40%	26.20%

Contribution Rates for FYE 2018

Employer contribution requirements for FYE 2018 for TRSL vary from sub plan to sub plan. Prior to June 30, 2016, TRSL contained four sub plans – Regular Teachers, Lunch Plan A, and Lunch Plan B, and Higher Education − each with its set of contribution rates. However, as a result of Act 95 of the 2016 regular session of the legislature, the number of sub plans was reduced from four to two. Beginning with the June 30, 2016 valuation, the K-12 Sub Plan will, in general, contain teachers employed by school districts, as well as employees classified as Lunch Plan A and Lunch Plan B. The Higher Education Sub Plan has not been changed.

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

1. Total normal cost
2. Employee normal cost
3. Employer normal cost
4. UAL costs that are shared by both sub plans
5. UAL costs that are specific to a particular sub plan.

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

Projected Contribution Rates for FYE 2018						
Membership Group	Status 7/1/2016	Total NC % (A)	Employee NC % (B)	Employer NC % (C) = (A) - (B)	Shared UAL % (D)	Total Employer Cost % (E) = (C) + (D)
Aggregated K–12 (Regular Teachers, Lunch A & B)	O/C*	15.5599	7.9797	7.5802	29.3689	36.9491
Higher Education	O	14.1082	8.0000	6.1082	29.3689	35.4771
Total		15.3501	7.9826	7.3674	29.3689	36.7363

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

Sources and Amounts of Gains and Losses for FYE 2016

Gains and losses measured during FYE 2016 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, 2015.

A.	**Unfunded Accrued Liability on June 30, 2015**		**$ 11,189,053,202**
B.	**Increases in the UAL Due to:**		
	1. Interest on the UAL	$ 867,151,623	
	2. Permanent Benefit Increase	216,473,124	
	3. Employer Contribution Shortfall	0	
	4. Assumption Change	0	
	5. Investment Loss	184,262,638	
	6. Experience Loss	0	
	7. Total Increases = B1 + B2 + B3 + B4 + B5 + B6		**$ 1,267,887,385**
C.	**Decreases in the UAL Due to:**		
	1. Employer Amortization Payment	$ 1,000,284,318	
	2. Disbursement from the Experience Account	216,473,124	
	3. Employer Contribution Surplus	64,452,206	
	4. Investment Gain	0	
	5. Experience Gain	157,650,103	
	6. Total Decreases = C1 + C2 + C3 + C4 + C5		**$ 1,438,859,751**
D.	**Unfunded Accrued Liability on June 30, 2016** = A + B7 - C6		**$ 11,018,080,836**

Actuarial Certification

This report, prepared with assistance from and reliance on work products prepared by GRS, 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

Nov 28, 2016 — Date

SECTION I:
DEVELOPMENT OF EMPLOYER CONTRIBUTIONS

1. Employer Contribution Requirements for FYE 2017 - Combined Plan

Employer contribution requirements for FYE 2017, 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. 11:102D 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.

		Dollar Amount	Percent of Salary
A.	**Employer Portion of Normal Cost**	$ 160,358,973	4.074831%
B.	**Shared Amortization Payments**	974,555,726	21.666977%
C.	**Contribution Variance Payments**	2,735,460	0.060817%
D.	**Total Contribution = A + B + C**	1,137,650,159	25.802625%
E.	**Projected Payroll for FYE 2017**		
	(1) Projected Payroll for Normal Costs	3,935,352,728	
	(2) Projected Payroll for Amortization Costs	4,497,872,047	
F.	**Total Contribution Rate for FYE 2017**		
	(1) Employer Normal Cost Rate = A / E1	4.07%	
	(2) Employer Amortization Cost Rate = (B + C) / E2	21.73%	
	(3) Total Employer Contribution Rate = F1 + F2	25.80%	
G.	**Minimum Contribution Rate**	15.50%	
H.	**Minimum Required Contribution for FYE 2017 = A + E2 x (15.5% - F1)**	674,465,748	15.500000%
I.	**Required Employer Contribution for FYE 2017 = The Greater of D and H**	1,137,650,159	25.802625%

2. 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. 11:102D 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.

		Dollar Amount	Percent of Salary
A.	**Employer Portion of Normal Cost**	$ 298,607,400	7.367439%
B.	**Shared Amortization Payments**	1,353,171,345	29.210842%
C.	**Contribution Variance Payments**	7,321,991	0.158059%
D.	**Total Contribution = A + B + C**	1,659,100,736	36.736340%
E.	**Projected Payroll for FYE 2018**		
	(1) Projected Payroll for Normal Costs	4,053,069,190	
	(2) Projected Payroll for Amortization Costs	4,632,414,900	
F.	**Total Contribution Rate for FYE 2018**		
	(1) Employer Normal Cost Rate = A / E1	7.37%	
	(2) Employer Amortization Cost Rate = (B + C) / E2	29.37%	
	(3) Total Employer Contribution Rate = F1 + F2	36.74%	
G.	**Minimum Contribution Rate**	15.50%	
H.	**Minimum Required Contribution for FYE 2018 = A + E2 x (15.5% - F1)**	675,222,731	15.500000%
I.	**Required Employer Contribution for FYE 2018 = The Greater of D and H**	1,659,100,736	36.736340%

3. Normal Cost Values - Combined Plan

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 2017 are based on the valuation of normal costs as of June 30, 2016. The total normal cost percentage is calculated as the total normal cost for FYE 2017 divided by the payroll as of June 30, 2016. The employee normal cost is calculated as employee contributions collected in FYE 2016 divided by the June 30, 2016 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 2017 to determine dollar contribution amounts for that fiscal year.

Projected normal costs for FYE 2018 are calculated in a similar manner. The calculated normal cost percentages, however, are multiplied by projected payroll amounts for FYE 2018.

Normal costs and projected payroll values for FYE 2017 and 2018 are based on 7.75% and 7.00% 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).

		June 30, 2016 Valuation		June 30, 2015 Valuation	
		Actuarial	Projected	Actuarial	Projected
A.	**Total Normal Cost**				
	1. Retirement Benefits	$ 304,492,745	$ 386,106,760	$ 306,147,279	$ 331,848,970
	2. Disability Benefits	14,365,660	17,871,381	14,130,553	14,947,763
	3. Survivor Benefits	10,964,092	8,281,832	10,664,199	11,304,418
	4. Voluntary Benefits	136,768,983	163,945,812	132,841,215	140,380,141
	5. Load for Administrative Expenses	N/A	17,800,758	N/A	N/A
	6. Total Normal Cost	$ 466,591,480	$ 594,006,543	$ 463,783,246	$ 498,481,292
B.	**Payrolls**				
	1. On Valuation Date	$3,869,730,024	$3,869,730,024	$3,815,649,662	$3,815,649,662
	2. Projected for FY after Valuation Date	3,935,352,728	n/a	3,887,668,656	n/a
	3. Projected for 2nd FY after Valuation Date	n/a	4,053,069,190	n/a	4,016,926,538
	4. ORP – Salary Adjustment Factor	1.14294	1.14294	1.14553	1.14553
C.	**Normal Cost Rates**				
	1. Total Normal Cost Rate = A6 / B1	12.057469%	15.350077%	12.154765%	13.064126%
	2. Employee Normal Cost Rate	7.982638%	7.982638%	7.982409%	7.982409%
	3. Employer Normal Cost Rate = C1 – C2	4.074831%	7.367439%	4.172356%	5.081717%

		June 30, 2016 Valuation		June 30, 2015 Valuation	
		Actuarial	Projected	Actuarial	Projected
D.	**Employer Normal Cost**				
	1. For 1st FY after Valuation Date = B2 x C3	$ 160,358,973	n/a	$ 162,207,376	n/a
	2. For 2nd FY after Valuation Date = B3 x C3	n/a	$ 298,607,400	n/a	$ 204,128,839
E.	**Employee Normal Cost**				
	1. For 1st FY after Valuation Date = B2 x C2	$ 314,144,962	n/a	$ 310,329,613	n/a
	2. For 2nd FY after Valuation Date = B3 x C2	n/a	$ 323,541,842	n/a	$ 320,647,506
F.	**Total Normal Cost**				
	1. For FYE 2017 = D1 + E1	$ 474,503,935	n/a	$ 472,536,989	n/a
	2. For FYE 2018 = D2 + E2	n/a	$ 622,149,243	n/a	$ 524,776,345

Increases in Normal Costs Attributable to Assumption Changes

The following assumptions will be changed effective June 30, 2017:

a. Mortality Tables,

b. Investment Return, Inflation and the Discount Rate assumptions,

c. Treatment of Administrative Expenses and

d. Treatment of Gain-sharing COLA benefits.

In particular, the discount rate will be changed from 7.75% to 7.00% on June 30, 2017. Please refer to the Appendices for further details pertaining to the assumption changes. The effect on normal costs has been measured effective June 30, 2016. It is assumed that the increase in the normal cost would be proportionate if it had been measured on June 30, 2017 instead of June 30, 2016. Increases associated with the various components of the normal cost are shown on the following page.

Development of Employer Contributions

		For FYE 2017 Old Assumptions	For FYE 2017 New Assumptions	Increase/ (Decrease)
A.	**Total Normal Cost**			
	1. Retirement Benefits	$ 304,492,745	$ 386,106,760	$ 81,614,015
	2. Disability Benefits	14,365,660	17,871,381	3,505,721
	3. Survivor benefits	10,964,092	8,281,832	(2,682,260)
	4. Voluntary Terminations	136,768,983	163,945,812	27,176,829
	5. Load for Administrative Expenses	N/A	17,800,758	17,800,758
	6. Total Normal Cost	$ 466,591,480	$ 594,006,543	$ 127,415,063
B.	**Payrolls**			
	1. Projected Payroll on June 30, 2016	3,869,730,024	3,869,730,024	0
	2. Projected Payroll for FYE 2017	3,935,352,728	3,935,352,728	0
	3. Projected Payroll for FYE 2018	4,053,069,190	4,053,069,190	0
	4. ORP - Salary Adjustment Factor	1.14294	1.14294	
C.	**Normal Cost Rates**			
	1. Total Normal Cost Rate	12.057469%	15.350077%	3.292608%
	2. Employee Normal Cost Rate	7.982638%	7.982638%	0.000000%
	3. Employer Normal Cost Rate = C1 – C2	4.074831%	7.367439%	3.292608%
D.	**Employer Normal Costs**			
	1. Projected Cost for FYE 2017 = B2 x C3	160,358,973	289,934,712	129,575,739
	2. Projected Cost for FYE 2018 = B3 x C3	165,155,720	298,607,400	133,451,680
E.	**Employee Normal Costs**			
	1. Projected Cost for FYE 2017 = B2 x C2	314,144,962	314,144,962	0
	2. Projected Cost for FYE 2018 = B3 x C2	323,541,841	323,541,841	0

4. Unfunded Accrued Liability

Unfunded Accrued Liability as of June 30, 2016

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, 2016, are based on the 7.75% discount rate net of investment expenses, or the long-term rate of return assumption (8.10%) net of administrative expenses and gain sharing, and other assumptions and methods applicable to FYE 2017 as described in Section IV of this report. The unfunded accrued liability is based on the actuarial value of assets measured on June 30, 2016.

The components of the unfunded accrued liability on June 30, 2016, and June 30, 2015 are shown below.

		June 30, 2016	June 30, 2015
A.	**Accrued Liability**		
	1. Accrued Liability for Active Members		
	(a) Retirement Benefits	$ 7,703,033,944	$ 7,642,648,734
	(b) Disability Benefits	144,592,915	141,698,457
	(c) Survivor Benefits	135,025,810	132,277,860
	(d) Voluntary Terminations	272,396,531	231,997,284
	(e) Total	$ 8,255,049,200	$ 8,148,622,335
	(f) Ratio of Active Liability to Total Accrued Liability	28.20%	28.45%
	2. Accrued Liability for Retired and Inactive Members		
	(a) Regular Retirees	$ 16,101,366,471	$ 15,700,534,358
	(b) Disability Retirees	445,123,589	415,620,096
	(c) Survivors	1,057,732,944	1,004,696,859
	(d) Members with a Deferred Benefit	306,722,016	298,144,696
	(e) Contributions to be Refunded	131,749,421	129,177,219
	(f) Deferred Benefits for DROP Members	1,873,371,007	1,822,045,328
	(g) Account Balances for DROP Members	1,101,287,330	1,127,456,006
	(h) Total	$ 21,017,352,778	$ 20,497,674,562
	(i) Ratio of Inactive Liability to Total Accrued Liability	71.80%	71.55%
	3. Total Accrued Liability	$ 29,272,401,978	$ 28,646,296,897
B.	**Valuation Assets**	$ 18,254,321,142	$ 17,457,243,695
C.	**Unfunded Accrued Liability**	$ 11,018,080,836	$ 11,189,053,202
D.	**Funded Ratio = B / A3**	62.36%	60.94%

The unfunded accrued liability on June 30, 2016, is reconciled below with the unfunded accrued liability on June 30, 2015.

A.	**Unfunded Accrued Liability on June 30, 2015**		**$ 11,189,053,202**
B.	**Increases in the UAL Due to:**		
	1. Interest on the UAL	$ 867,151,623	
	2. Permanent Benefit Increase	216,473,124	
	3. Employer Contribution Shortfall	0	
	4. Assumption Change	0	
	5. Investment Loss	184,262,638	
	6. Experience Loss	0	
	7. Total Increases = B1 + B2 + B3 + B4 + B5 + B6		**1,267,887,385**
C.	**Decreases in the UAL Due to:**		
	1. Employer Amortization Payment	$ 1,000,284,318	
	2. Legislative Allocation	216,473,124	
	3. Employer Contribution Surplus	64,452,206	
	4. Investment Gain	0	
	5. Experience Gain	157,650,103	
	6. Total Decreases = C1 + C2 + C3 + C4 + C5		**1,438,859,751**
D.	**Unfunded Accrued Liability on June 30, 2016** = A + B7 – C6		**$ 11,018,080,836**

Projected Increases in Accrued Liabilities on June 30, 2017 Attributable to Assumption and Method Changes.

The following assumptions and methods will be changed effective June 30, 2017.

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

2. The return on Investments assumption will be changed from 8.10% to 7.00%. The discount rate will be changed from 7.75% to 7.00%.

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, 2016 have been calculated and projected to June 30, 2017. For this comparison, we have assumed that June 30, 2017 values with and without the assumption and method changes will be the same as June 30, 2016 values with and without assumption and method changes. Projected values as of June 30, 2017 are compared below.

Development of Employer Contributions

		June 30, 2016 Old Assumptions	June 30, 2016 New Assumptions	Increase/ (Decrease)
A.	Accrued Liability for Active Members	$ 8,255,049,200	$ 9,839,504,713	$ 1,584,455,513
B.	Accrued Liability for Retired and Inactive	21,017,352,778	23,919,606,790	2,902,254,012
C.	Accrued Liability on June 30, 2016 = A + B	29,272,401,978	33,759,111,503	4,486,709,525
D.	Interest Adjustment	2,268,611,153	2,363,137,805	94,526,652
E.	Normal Cost	474,503,917	604,079,679	129,575,762
F.	Interest Adjustment for One Half Year	18,043,948	20,785,200	2,741,252
G.	Estimated Benefit Payments	2,050,287,273	2,050,287,273	0
H.	Interest Adjustment for One-Half Year	77,966,222	70,546,373	(7,419,849)
I.	Projected Accrued Liability on June 30, 2017 = C + D + E + F – G – H	**$ 29,905,307,501**	**$ 34,626,280,541**	**$ 4,720,973,040**

Projected Unfunded Accrued Liability on June 30, 2017

The calculation of the projected unfunded accrued liability as of June 30, 2017, is shown below.

A.	**Unfunded Accrued Liability on June 30, 2016**		$ 11,018,080,836
B.	**Increases in the UAL Due to:**		
	1. Interest on the UAL	$ 853,901,263	
	2. Expected Employer Contribution Shortfall	19,493,198	
	3. Recognition of Gain Sharing	0	
	4. Assumption Changes	4,720,973,040	
	5. Total Increases = B1 + B2 + B3 + B4		$ 5,594,367,501
C.	**Decreases in the UAL Due to:**		
	1. Employer Amortization Payment	$ 1,014,454,613	
	2. Employer Contribution Surplus	0	
	3. Total Decreases = C1 + C2		$ 1,014,454,613
D.	**Unfunded Accrued Liability on June 30, 2017** = A + B5 – C3		$ 15,597,993,724

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, 2016	June 30, 2015	June 30, 2014	June 30, 2013
	1. BOY Market Value	$ 17,896,379,678	$ 17,886,838,190	$ 15,490,236,860	$ 14,188,983,721
	2. Contributions	1,528,698,762	1,581,664,935	1,538,445,595	1,423,250,702
	3. Legislative Appropriations	0	10,384,806	5,578,791	0
	4. Benefit Payments	2,050,287,273	2,008,403,199	1,934,766,027	1,859,319,285
	5. Administrative Expenses	17,432,419	19,265,221	17,522,895	17,661,969
	6. EOY Market Value	17,537,950,955	17,896,379,678	17,900,035,458	15,490,236,860
	7. Actual Investment Income = A6 – A1 – A2 – A3 + A4 + A5	180,592,207	445,160,167	2,818,063,134	1,754,983,691
	8. Expected Investment Income Based on the Discount Rate	1,366,082,362	1,368,947,325	1,222,665,216	1,151,874,772
	9. Gain/(Loss) = A7 – A8	(1,185,490,155)	(923,787,158)	1,595,397,918	603,108,919

B.	Market Value Adjustment	Gain/(Loss) (a)	Factor (b)	Market Value Adjustment (c) = (a) x (b)
	1. Adjustment for 2016	$ (1,185,490,155)	80%	$ (948,392,124)
	2. Adjustment for 2015	(923,787,158)	60%	(554,272,295)
	3. Adjustment for 2014	1,595,397,918	40%	638,159,167
	4. Adjustment for 2013	603,108,919	20%	120,621,784
	5. Total Market Value Adjustment			(743,883,468)

C.	**Preliminary Actuarial Value**	
	1. Market Value on June 30, 2016 = A6	17,537,950,955
	2. Market Value Adjustment = B5	(743,883,468)
	3. Preliminary Actuarial Value = C1 – C2	18,281,834,423
D.	Corridor Values	
	1. 80% x Market Value	14,030,360,764
	2. 120% x Market Value	21,045,541,146
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	$ 18,281,834,423

B. Investment Gain/(Loss)

The investment gain/(loss) is measured as the difference between actuarial and expected investment earnings during FYE 2016.

A.	**Components of the Gain/(Loss) Calculation**	
	1. Net Actuarial Value of Assets on June 30, 2015	$ 17,264,803,247
	2. Contributions for FYE 2016	1,433,180,059
	3. Legislative Appropriations	0
	4. Benefits Paid for FYE 2016	1,948,812,645
	5. Administrative Expenses Paid for FYE 2016	17,432,419
	6. Net Actuarial Value of Assets on June 30, 2016	17,865,227,006
	7. Expected Rate of Return on Assets	7.75%
B.	Actual Investment Earnings = A6 – A1 – A2 – A3 + A4 + A5	$ 1,133,488,764
C.	Expected Investment Earnings	1,317,751,402
D.	Investment Gain/(Loss) = B – C	$ (184,262,638)

C. Allocation of Investment Gains to 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.

A.	**Excess Investment Earnings = Gross Investment Gain**	0
B.	**Excess Investment Earnings Paid to DROP Accounts**	
	1. DROP Accounts Eligible for System Investment Earnings	
	a. Total of all DROP and IBO accounts	$ 1,068,177,616
	b. DROP accounts for Actives not entitled to system earnings	114,945,983
	c. Self-directed DROP accounts not entitled to system earnings	416,607,417
	d. DROP accounts entitled to system earnings = B1a – B1b – B1c	536,624,216

	2. Rate of Return Attributable to Excess Earnings on DROP Accounts	
	a. Adjusted Actual rate of return on investments for DROP accounts	6.385950%
	b. Adjusted Expected rate of return for DROP accounts*	7.503750%
	c. Rate of return attributable to excess earnings = B2a – B2b	0.000000%
	3. Excess Investment Earnings Paid to DROP Accounts = B1d x B2c	0
C.	**Investment Gain/(Loss) Paid to LSU Ext Service Account**	
	1. LSU Ag Ext Service Account at Beginning of the Year	2,360,090
	2. Contributions to the LSU Ag Ext Service at the Beginning of the Year	1,830,995
	3. Benefit Payments from the LSU Ag Ext Service Account at Mid-Year	1,873,303
	4. Actual Rate of Return on Investments for LSU Ag Ext Service Accounts	6.668259%
	5. Expected Rate of Return for LSU Ag Ext Service Accounts	7.75%
	6. Actual Investment Earnings on LSU Ag Ext Service Account	218,022
	7. Expected Investment Earnings on LSU Ag Ext Service Account	253,573
	8. Excess Investment Earnings Paid to LSU Ag Ext Service Account = C6 – C7, not less than 0	0
D.	**Benefit Disbursements**	216,473,124
E.	**Investment Gain/(Loss) Paid to the Experience Account**	
	1. Experience Account Assets Entitled to System Earnings	226,356,559
	2. Actuarial Rate of Return on the Actuarial Value of Assets	6.668259%
	3. Preliminary Expected Investment Earnings Payable to the EA = E1 x E2	15,094,042
	4. Maximum Fund in the Experience Account = Present Value of a 1.5% PBI	216,473,124
	5. Maximum Investment Earnings Payable to the Experience Account = E4 - (E1 - D)	206,589,689
	6. Investment Earnings Payable to the EA = lesser of E5 and E3	15,094,042
	7. Investment Earnings to be Treated as an Investment Gain = E6 - E3	0
	8. Experience Account End of Period = lesser of E4 and (E1 - D + E6)	24,977,477
	9. Maximum Excess Investment Earnings that Can be Applied to EA = E4 – E8	191,495,647
F.	**Miscellaneous Items**	0
G.	**Net Excess Investment Earnings = A – B3 – C8 + E7 – F, not less than 0**	0
H.	**Allocation of Excess Investment Earnings to the Experience Account**	
	1. Net Excess Investment Earnings = G	0
	2. Administrative Expense	0
	3. Threshold Gain	206,738,385
	4. Gain Available for Gain Sharing = H1 – H2 – H3, not less than 0	0
	5. Gain Sharing Percentage	50%
	6. Preliminary Allocation of Excess Gains to the Experience Account = G4×G5	0
	7. Maximum Excess Investment Earnings that Can be Applied to EA = E9	191,495,647
	8. Allocation of Excess Gains to the Experience Account = lesser H6 and H7	0

* [(Discount Rate – 50 Basis Points) / 100 x Adjustment Factor] x 100
= (7.75% - 0.5%)/100 * 1.035 * 100 = 7.50375%

D. Employer Shortfall/(Surplus)

Employer Contribution Shortfall/(Surplus) for FYE 2016

Total contributions received from participating employers were higher in FYE 2016 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, 2016, is shown below.

A.	**Actual Employer Contributions**	
	1. Employer Contributions	$ 1,066,521,193
	2. Employer Amortization Payments for ORP Members	128,543,466
	3. Other Appropriations	34,500
	4. Actual Employer Contributions = A1 + A2 + A3	$ 1,195,099,159
B.	**Expected Employer Contributions**	
	1. Employee Contributions for Regular Teachers	$ 322,718,902
	2. Employee Contribution Rate for Regular Teachers	8.00%
	3. Salaries upon which Employer Contributions Received = B1 / B2	4,033,986,275
	4. Employee Contributions for Lunch Plan A Members	68,181
	5. Employee Contribution Rate for Lunch Plan A Members	9.10%
	6. Salaries upon which Employer Contributions Were Received = B4 / B5	749,241
	7. Employee Contributions for Lunch Plan B Members	1,190,890
	8. Employee Contribution Rate for Lunch Plan B Members	5.00%
	9. Salaries upon which Employer Contributions Received = B7 / B8	23,817,791
	10. Total Salaries upon which Contributions Were Received = B3 + B6 + B9	$ 4,058,553,307
	11. Employer Normal Cost Rate for FYE 2016	4.17311470%
	12. Employer Normal Costs = B10 x B11	169,368,085
	13. Contributions to the Employer Credit Account for FYE 2016	0
	14. Amortization Payments for FYE 2016	935,381,362
	15. Payment toward Contribution Variances for FYE 2016	28,258,642
	16. Expected Employer Contributions = B12 + B13 + B14 + B15	1,133,008,089
C.	**Mid-Year Employer Shortfall/(Surplus) for FYE 2016 = B16 – A4**	$ (62,091,070)
D.	**Interest at 7.75% for One-Half Year**	(2,361,136)
E.	**Employer Shortfall/(Surplus) on June 30, 2016 = C + D**	$ (64,452,206)

Projected Employer Contribution Shortfall/(Surplus) for FYE 2017

A surplus in employer contributions is expected to occur for FYE 2017 because the actual employer contribution rate, 26.4% of pay for FYE 2017, is less than the projected 25.4% rate of pay set by PRSAC a year ago. The expected surplus of employer contributions is calculated below.

A.	**Projected Employer Contribution Shortfall/(Surplus) for Regular Non-ORP Members**	
	1. Actual Employer Contributions Required in Mid-Year for FYE 2017	$ 1,015,321,004
	2. Projected Employer Contributions Expected in Mid-Year for FYE 2017	999,579,593
	3. Shortfall/(Surplus) of Regular Employer Contributions Expected Mid-Year for FYE 2017 = A1 – A2	$ 15,741,411
B.	**Projected Employer Contribution Shortfall/(Surplus) for ORP Members**	
	1. Projected Employer Contribution Rate for FYE 2017	21.1902%
	2. Actual Employer Contribution Rate for FYE 2017	21.7278%
	3. Contribution Rate Shortfall for FYE 2017 = B2 – B1	0.005376
	4. Actual ORP Payroll for FYE 2017	562,532,436
	5. Shortfall/(Surplus) of ORP Employer Contributions Expected Mid-Year for FYE 2017 = B3 x B4	$ 3,024,354
		$ 18,765,765
C.	**Total Employer Contribution Shortfall/(Surplus) at Mid-Year 2017 = A3 + B5**	$ 714,112
D.	**Interest for One-Half Year**	$ 19,493,198
E.	**Total Employer Contribution Shortfall/(Surplus) at FYE 2017**	

E. Asset Allocation (Market Values)

		June 30, 2016	June 30, 2015
A.	**Short-Term Assets**		
	1. Cash/Cash Equivalents	$ 5,279,450	$ 236,026,000
	2. Short-Term Investments	1,307,428,499	990,777,882
B.	**Bonds**		
	1. Domestic Issues	1,828,132,715	1,775,656,703
	2. International Issues	1,413,994,202	1,489,882,945
C.	**Equities**		
	1. Domestic Stock	5,161,381,152	5,478,561,612
	2. International Stock	3,166,197,700	3,429,594,486
D.	**Other Assets**		
	1. Fixed Assets	3,710,875	4,051,370
	2. Real Estate and Alternative Investments	4,573,041,477	4,358,084,637
E.	**Receivables Minus Payables**	78,784,885	133,744,043
F.	**Other Adjustments**	0	0
G.	**Total Assets**	$ 17,537,950,955	$ 17,896,379,678

F. Income Statement (Market Value)

		FYE June 30, 2016	FYE June 30, 2015
A.	**Income**		
	1. Contribution Income		
	a. Member Contributions	$ 330,773,316	$ 324,920,644
	b. Employer Contributions	1,066,521,193	1,120,150,411
	c. ORP Contributions	128,543,466	133,771,593
	d. Total = A1a + A1b + A1c	1,525,837,975	1,578,842,648
	2. Other Income		
	a. IUAL Appropriations	0	10,384,806
	b. Other Appropriations	34,500	41,721
	c. LSU Coop/Ext	1,830,995	1,851,985
	d. Miscellaneous	995,292	928,581
	e. Total = A2a + A2b + A2c + A2d	2,860,787	13,207,093
	3. Net Investment Income		
	a. Investment Income	216,567,366	481,866,158
	b. Investment Expense	35,975,157	36,705,991
	c. Net Investment Income = A3a – A3b	180,592,209	445,160,167
	Total Income = A1d + A2e + A3c	$ 1,709,290,971	$ 2,037,209,908
B.	**Expense**		
	1. Operating Expense		
	a. General Administration	15,275,760	15,116,429
	b. Post-Employment Benefits	(24,005)	1,685,836
	c. Depreciation	407,105	384,426
	d. Other Expenses	1,773,559	2,078,530
	e. Total = B1a + B1b + B1c + B1d	17,432,419	19,265,221
	2. Benefit Payments		
	a. Pension Benefits	2,001,145,698	1,956,857,437
	b. Return of Employee Contributions	49,141,575	51,545,762
	c. Total = B2a + B2b	2,050,287,273	2,008,403,199
	3. Total Expense = B1e + B2c	$ 2,067,719,692	$ 2,027,668,420
C.	**Net Income = A4 – B3**	$ (358,428,721)	$ 9,541,488

G. Allocation of Assets to Sub Accounts

		FYE June 30, 2016	FYE June 30, 2015
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	$ 226,356,559	$ 218,148,161
	2. Allocation for Current Year	0	0
	3. Disbursements for Current Year	(216,473,124)	0
	4. Accumulated Interest	15,094,042	8,208,398
	5. Ending Balance for Current Year = C1 + C2 + C3 + C4	$24,977,477	$226,356,559
D.	**LSU Ag/Ext Service**		
	1. Beginning Balance for Current Year	$ 2,360,090	$ 1,933,057
	2. Allocation for Current Year	1,830,995	1,851,985
	3. Disbursements for Current Year	1,873,303	1,754,855
	4. Accumulated Interest	218,022	329,903
	5. Ending Balance for Current Year = D1 + D2 – D3 + D4	$2,535,804	$2,360,090
E.	**Valuation Assets**		
	1. Actuarial Value of Assets	$ 18,281,834,423	$ 17,685,960,344
	2. Employer Credit Account = A5	0	0
	3. Initial UAL Amortization Fund = B5	0	0
	4. Experience Account Fund = C5	24,977,477	226,356,559
	5. LSU Ag/Ext Service = D5	2,535,804	2,360,090
	6. Valuation Assets = E1 – E2 – E3 – E4 – E5	$ 18,254,321,142	$ 17,457,243,695

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, 2015	$ 17,896,379,678	$ 421,157,097	$ 17,475,222,581
B.	Contributions	$ 1,528,698,762	$ 95,518,703	$ 1,433,180,059
C.	Benefit Payments	$ 2,050,287,273	$ 101,474,628	$ 1,948,812,645
D.	Administrative Expenses	17,432,419	0	17,432,419
E.	Asset Value on June 30, 2016	$ 17,537,950,955	$ 416,607,417	$ 17,121,343,538
F.	Investment Income = E – A – B + C + D	$ 180,592,207	$ 1,406,245	$ 179,185,962
G.	Unrounded Rates of Return	1.024528%	0.336278%	1.041253%
H.	Rounded Rate of Return on Investments	1.02%	0.34%	1.04%

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, 2015	$ 17,685,960,344	$ 421,157,097	$ 17,264,803,247
B.	Contributions	1,528,698,762	95,518,703	1,433,180,059
C.	Benefit Payments	2,050,287,273	101,474,628	1,948,812,645
D.	Administrative Expenses	17,432,419	0	17,432,419
E.	Asset Value on June 30, 2016	$ 18,281,834,423	$ 416,607,417	$ 17,865,227,006
F.	Investment Income = E – A – B + C + D	$ 1,134,895,009	$ 1,406,245	$ 1,133,488,764
G.	Unrounded Rates of Return	6.516225%	0.336278%	6.668259%
H.	Rounded Rate of Return on Investments	6.52%	0.34%	6.67%

C. Rate of Return to Be Granted on Drop Accounts

A.	Rounded Rate of Return on the Net Actuarial Value of Assets	6.67%
B.	Reduction for Administrative Expenses	0.50%
C.	Rate of Return to Be Granted on DROP Accounts	6.17%

D. Summary of Rates of Return on Investments

		Rates Measured on June 30				
		2016	**2015**	**2014**	**2013**	**2012**
A.	Total Market Value	1.02%	2.52%	18.44%	12.57%	-0.39%
B.	Market Value Net of Self-Directed and ORP Accounts	1.04%	2.58%	18.90%	12.79%	-0.32%
C.	Actuarial Value Net of Self-Directed and ORP Accounts	6.67%	11.26%	13.14%	13.41%	5.05%
D.	Five-Year Geometric Average of the Actuarial Value Net of Self-Directed and ORP Accounts	9.85%	9.80%	7.30%	1.96%	0.43%
E.	Interest Credited to Self-Directed and ORP Accounts	0.34%	10.76%	12.64%	12.91%	4.95%

7. Amortization Payments for FYE 2017

Year	Description	Amortization Method	Amortization Period	Initial Liability	Years Remaining	Balance on June 30, 2016	Mid-Year Payment	Balance on June 30, 2017
Shared Bases								
2010	Orig Amort Base	I	19	$ 2,677,501,778	13	$ 2,315,374,153	$ 261,202,822	$ 2,223,680,075
2010	Exp Acct Amort Base	I	30	3,999,115,151	24	3,694,542,686	344,217,565	3,623,562,626
2009	Change in Liability	L	30	2,979,708,647	23	2,746,828,480	249,988,498	2,700,212,883
2010	Change in Liability	L	30	1,150,854,854	24	1,076,594,214	96,461,424	1,059,900,705
2011	Change in Liability	L	30	(175,198,199)	25	(166,100,327)	(14,671,243)	(163,743,956)
2012	Change in Liability	L	30	125,767,665	26	120,701,146	10,522,700	119,132,638
2013	Change in Liability	L	30	(248,560,781)	27	(241,222,916)	(20,779,159)	(238,348,364)
2013	Assumption Change	L	30	871,681,891	27	845,948,613	72,870,774	835,867,801
2013	Asset Valuation Method	L	30	(25,686,598)	27	(24,928,293)	(2,147,346)	(24,631,233)
2014	Liability Gain	L	30	(162,364,783)	28	(159,247,780)	(13,567,695)	(157,505,850)
2014	Assumption Change	L	30	570,933,583	28	559,973,064	47,708,947	553,847,803
2014	Funding Method	L	30	881,187,059	28	864,270,435	73,634,672	854,816,618
2014	Reduction in EA Deposit	L	5	(76,831,515)	3	(49,487,704)	(18,416,019)	(34,206,677)
2014	Gain from $100-$200M	L	5	(100,000,000)	3	(64,410,684)	(23,969,356)	(44,521,674)
2014	Remaining Investment Gain	L	5	(247,166,403)	3	(159,201,571)	(59,244,196)	(110,042,619)
2015	Experience Gain	L	30	(37,106,169)	29	(36,763,283)	(3,100,704)	(36,393,823)
2015	Investment Gain	L	30	(339,621,226)	29	(336,482,888)	(28,379,783)	(333,101,332)
2016	Experience Gain	L	30	(157,650,103)	30	(157,650,103)	(13,173,722)	(156,193,307)
2016	Investment Loss	L	30	184,262,638	30	184,262,638	15,397,547	182,559,923
Total				$11,870,827,489		$ 11,012,999,880	$ 974,555,726	$ 10,854,892,237
Employers Credit Balance								
2013	Contribution Variance	L	5	$ 11,400,601	2	$ 5,080,956	$ 2,735,460	$ 2,635,249
Total				$ 11,400,601		$ 5,080,956	$ 2,735,460	$ 2,635,249
Grand Total						**$ 11,018,080,836**	**$ 977,291,186**	**$ 10,857,527,486**

8. 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	$ 2,223,680,075	$ 277,558,112	$ 2,092,229,337
2010	Exp Acct Amort Base	I	30	3,999,115,151	23	3,623,562,626	365,395,967	3,499,243,483
2009	Change in Liability	L	30	2,979,708,647	22	2,700,212,883	235,994,717	2,645,112,951
2010	Change in Liability	L	30	1,150,854,854	23	1,059,900,705	90,900,253	1,040,065,802
2011	Change in Liability	L	30	(175,198,199)	24	(163,743,956)	(13,801,783)	(160,929,358)
2012	Change in Liability	L	30	125,767,665	25	119,132,638	9,882,786	117,249,089
2013	Change in Liability	L	30	(248,560,781)	26	(238,348,364)	(19,484,557)	(234,877,767)
2013	Assumption Change	L	30	871,681,891	26	835,867,801	68,330,714	823,696,707
2013	Asset Valuation Method	L	30	(25,686,598)	26	(24,631,233)	(2,013,560)	(24,272,577)
2014	Liability Gain	L	30	(162,364,783)	27	(157,505,850)	(12,702,957)	(155,391,219)
2014	Assumption Change	L	30	570,933,583	27	553,847,803	44,668,214	546,411,989
2014	Funding Method	L	30	881,187,059	27	854,816,618	68,941,560	843,340,077
2014	Reduction in EA Deposit	L	5	(76,831,515)	2	(34,206,677)	(18,290,105)	(17,681,713)
2014	Gain from $100-$200M	L	5	(100,000,000)	2	(44,521,674)	(23,805,473)	(23,013,618)
2014	Remaining Investment Gain	L	5	(247,166,403)	2	(110,042,619)	(58,839,130)	(56,881,933)
2015	Experience Gain	L	30	(37,106,169)	28	(36,393,823)	(2,898,815)	(35,942,833)
2015	Investment Gain	L	30	(339,621,226)	28	(333,101,332)	(26,531,949)	(328,973,564)
2016	Experience Gain	L	30	(157,650,103)	29	(156,193,307)	(12,298,565)	(154,405,104)
2016	Investment Loss	L	30	184,262,638	29	182,559,923	14,374,656	180,469,858
2017	Mortality Assump Change	L	30	1,118,729,025	30	1,118,729,025	87,155,498	1,106,885,709
2017	DR/Sal Infl Assump Change	L	30	3,415,953,058	30	3,415,953,058	266,122,613	3,379,790,401
2017	Admin Expense Method Change	L	30	(331,777,338)	30	(331,777,338)	(25,847,385)	(328,265,009)
2017	COLA Method Change	L	30	518,068,295	30	518,068,295	40,360,534	512,583,815
Total				$16,591,800,529		$ 15,575,865,277	$ 1,353,171,345	$ 15,266,444,523
Employers Credit Balance								
2013	Contribution Variance	L	5	$ 11,400,601	1	$ 2,635,249	$ 2,725,923	$ -
2017	Contribution Variance	L	5	19,493,198	5	19,493,198	4,596,068	16,103,512
Total				$ 30,893,799		$ 22,128,447	$ 7,321,991	$ 16,103,512
Grand Total						**$ 15,597,993,724**	**$ 1,360,493,336**	**$ 15,282,548,035**

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 this discussion set forth above, we have valued the gain sharing/COLA program assuming that the COLA component is part of current law that must be valued.

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 50 basis points to account for the gain-sharing/COLA program. This is our current best estimate. We expect this estimate will change for future valuations with emerging plan experience and revisions in economic outlook.

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

If the plan liabilities are valued assuming a COLA in the amount of a half of a percent, then funding for the gain sharing/COLA program has been accounted for actuarially. An experience gain will occur if no investment gain is transferred to the Experience Account or if the transfer amount is less than the projected estimate. An experience loss will occur if the amount transferred is greater than the projected transfer.

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, 2016 Valuation

No investment gains were transferred to the Experience Account on June 30, 2016. Investment gains for FYE 2016 were less than the $207 million threshold applicable for FYE 2016. 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. 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 $207 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 $207 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,

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,

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 7.75%) 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. The 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. The TRSL's board of trustees must approve the COLA.

5. The 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 the 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.

SECTION III
BASIS FOR THE VALUATION

1. Introduction

The June 30, 2016 valuation is used to determine actuarial liabilities as of June 30, 2016, actual employer contribution requirements for FYE 2017, and projected employer contribution requirements for FYE 2018. Census data, actuarial methods, and actuarial assumptions used in the preparation of June 30, 2016 assets, liabilities, and employer contribution requirements for FYE 2017 are shown in this section of the report. Additional information is provided whenever a change has been made since the June 30, 2015 valuation or it is expected that a change will be made in the preparation of the June 30, 2017 valuation.

2. Census Data

Census data used in the preparation of the June 30, 2016 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	**2016**	**2015**	**2014**
Regular Teachers	71,511	70,881	70,210
Higher Education	8,792	8,803	8,580
Lunch Plan A	8	10	15
Lunch Plan B	1,162	1,192	1,216
Post DROP	2,595	2,716	2,865
Total Active Members	**84,068**	**83,602**	**82,886**
Retired and Inactive Members			
Regular Retirees	64,593	63,819	62,564
Disability Retirees	4,238	4,121	4,089
Survivors	6,997	6,772	6,541
DROP Participants	2,504	2,283	2,291
Vested & Reciprocal	6,687	6,606	6,334
Inactive Non-Vested (Due Refunds)	19,842	19,005	18,574
Total Inactive Members	**104,861**	**102,606**	**100,393**
Total Active and Inactive Members	**188,929**	**186,208**	**183,279**
Terminated Due Refund	(19,842)	(19,005)	(18,574)
Total Members	**169,087**	**167,203**	**164,705**

Membership Reconciliation

	Active (Pre DROP)	Active After DROP	Terminated Vested	In DROP	Retired, Disabled, Survivor	Total
Members on June 30, 2015	80,886	2,716	6,606	2,283	75,259	167,750
Additions to Census						
Added to Membership	7,782					7,782
Total Additions	7,782					7,782
Change in Status						
Active to Term Vested	(1,160)		1,160			
Active to In DROP	(899)			899		
Active to Retired	(1,473)				2,745	1,272
Active to Disabled	(187)				205	18
Active to Survivor	(41)				53	12
Terminated Vested to Active	498		(498)			
Terminated Vested to In DROP			(2)	2		
Terminated Vested to Retiree			(209)			(209)
Terminated to Disabled			(18)			(18)
Terminated to Survivor			(5)			(5)
In DROP to Active after DROP		437		(437)		
In DROP to Retired				(505)		(505)
In DROP to Survivor				(3)		(3)
Active after DROP to Retired		(558)				(558)
Active after DROP to Survivor		(4)				(4)
Disabled to Active	1				(1)	
Retired to Active						
Total Changes	(3,261)	(125)	428	(44)	3,002	
Eliminated from Census						
Refunded or Due Refund	(3,848)		(364)		(2)	(4,214)
Deceased	(40)	(1)	(19)	(2)	(2,158)	(2,220)
Total Eliminated	(3,888)	(1)	(383)	(2)	(2,160)	(6,434)
Data Revisions	(46)	5	36	267	(273)	(11)
Members on June 30, 2016	81,473	2,595	6,687	2,504	75,828	169,087

TRSL MEMBERSHIP PROFILE
ALL ACTIVE MEMBERS
(PRE-DROP)

CELLS DEPICT **Member Count** **Valuation Date** **6/30/2016**
Total Salary

Age/Service	[0-1)	[1-5)	[5-10)	[10-15)	[15-20)	[20-25)	[25-30)	[30-35)	[35+	TOTAL
[0-24)	665	1,186	-	-	-	-	-	-	-	1,851
	$ 27,123,254	48,007,115	-	-	-	-	-	-	-	$ 75,130,369
[25-29)	1,051	5,357	949	2	-	-	-	-	-	7,359
	42,891,612	225,075,052	42,920,451	70,623	-	-	-	-	-	310,957,738
[30-34)	830	3,936	4,225	1,067	2	-	-	-	-	10,060
	35,793,835	164,181,859	194,651,004	53,450,286	42,213	-	-	-	-	448,119,197
[35-39)	715	3,126	3,134	3,646	1,036	2	-	-	-	11,659
	30,210,045	124,460,106	141,037,354	185,814,288	56,283,030	61,319	-	-	-	537,866,142
[40-44)	517	2,386	2,476	2,441	3,096	785	1	-	-	11,702
	22,465,756	95,758,068	106,630,412	117,939,536	172,293,981	45,337,813	32,892	-	-	560,458,458
[45-49)	449	1,956	2,191	2,139	2,210	2,545	729	4	-	12,223
	18,440,938	74,864,012	88,286,845	96,157,536	112,683,464	149,102,102	43,795,055	162,953	-	583,492,905
[50-54)	318	1,549	1,774	1,868	1,853	1,781	2,107	106	-	11,356
	12,670,358	58,169,995	69,248,315	77,234,481	82,444,732	90,545,899	125,067,141	6,768,837	-	522,149,758
[55-59)	249	1,122	1,327	1,445	1,745	1,615	326	122	32	7,983
	10,737,137	42,251,116	52,000,011	58,145,300	74,507,155	75,633,111	18,134,110	7,717,564	2,365,910	341,491,414
[60-64)	141	584	796	852	845	921	362	137	121	4,759
	6,780,970	23,449,343	33,915,283	37,358,330	37,653,601	43,359,607	18,952,180	10,066,082	10,808,651	222,344,047
[65-69)	39	217	338	315	287	277	249	114	73	1,909
	1,284,572	8,842,345	14,734,491	14,347,549	13,642,834	13,045,967	13,517,925	8,035,606	7,119,201	94,570,490
[70+	19	46	115	89	71	74	66	71	61	612
	886,787	1,912,691	4,515,605	4,649,953	3,270,842	3,377,529	3,786,819	6,027,982	5,690,475	34,118,683
TOTAL	4,993	21,465	17,325	13,864	11,145	8,000	3,840	554	287	81,473
	$ 209,285,266	866,971,702	747,939,771	645,167,882	552,821,852	420,463,347	223,286,122	38,779,024	25,984,237	$ 3,730,699,203

AVERAGES	Attained Age	44.31
	Service Years	10.65
	Annual Salary	$45,791

TRSL MEMBERSHIP PROFILE
Active - Regular K-12

CELLS DEPICT **Member Count**
Total Salary

Valuation Date **6/30/2016**

Age/Service	[0-1)	[1-5)	[5-10)	[10-15)	[15-20)	[20-25)	[25-30)	[30-35)	[35+	TOTAL
[0-24)	558	1,117	-	-	-	-	-	-	-	1,675
	$ 22,823,368	45,720,665	-	-	-	-	-	-	-	$ 68,544,033
[25-29)	830	4,875	911	2	-	-	-	-	-	6,618
	32,920,465	205,887,352	41,191,395	70,623	-	-	-	-	-	280,069,835
[30-34)	627	3,297	3,892	1,038	2	-	-	-	-	8,856
	24,474,538	132,529,153	178,643,676	51,920,899	42,213	-	-	-	-	387,610,479
[35-39)	564	2,562	2,728	3,405	1,008	2	-	-	-	10,269
	21,205,749	94,947,235	118,594,824	172,528,529	54,695,187	61,319	-	-	-	462,032,843
[40-44)	414	1,988	2,165	2,195	2,993	772	1	-	-	10,528
	15,835,341	73,567,643	89,079,125	103,638,679	165,614,115	44,614,633	32,892	-	-	492,382,428
[45-49)	360	1,655	1,885	1,890	2,065	2,436	715	4	-	11,010
	13,263,340	59,765,651	71,897,988	80,674,166	103,794,519	142,118,288	42,885,226	162,953	-	514,562,131
[50-54)	256	1,229	1,465	1,620	1,698	1,676	2,032	95	-	10,071
	8,748,133	41,946,295	53,788,908	62,944,378	74,763,670	84,536,206	119,697,700	6,266,859	-	452,692,149
[55-59)	180	857	1,037	1,236	1,581	1,486	258	98	29	6,762
	6,479,451	27,542,716	36,370,109	46,359,099	66,208,668	68,245,268	14,251,515	6,121,830	2,254,635	273,833,291
[60-64)	97	424	611	696	769	855	304	74	86	3,916
	3,943,226	13,752,563	21,933,428	27,197,469	33,521,088	39,256,461	14,522,437	4,159,177	6,788,934	165,074,783
[65-69)	31	146	246	244	237	237	199	73	24	1,437
	960,475	5,098,666	8,985,314	9,186,166	10,536,876	10,553,455	9,404,998	3,729,107	1,821,428	60,276,485
[70+	12	26	73	54	50	58	47	32	17	369
	362,607	920,155	2,207,903	1,846,412	1,906,160	2,280,493	2,114,594	1,416,724	564,159	13,619,207
TOTAL	3,929	18,176	15,013	12,380	10,403	7,522	3,556	376	156	71,511
	$ 151,016,692	701,678,094	622,692,670	556,366,420	511,082,496	391,666,123	202,909,362	21,856,650	11,429,156	$ 3,170,697,663

AVERAGES		
	Attained Age	44.01
	Service Years	10.91
	Annual Salary	$44,339

TRSL MEMBERSHIP PROFILE
Active - Higher Education

CELLS DEPICT **Member Count**
Total Salary

Valuation Date **6/30/2016**

Age/Service	[0-1)	[1-5)	[5-10)	[10-15)	[15-20)	[20-25)	[25-30)	[30-35)	[35+	TOTAL
[0-24)	98	65	-	-	-	-	-	-	-	163
	$ 4,130,989	2,225,264	-	-	-	-	-	-	-	$ 6,356,253
[25-29)	214	467	37	-	-	-	-	-	-	718
	9,794,635	18,924,347	1,710,575	-	-	-	-	-	-	30,429,557
[30-34)	198	611	320	29	-	-	-	-	-	1,158
	11,192,059	31,192,349	15,770,462	1,529,387	-	-	-	-	-	59,684,257
[35-39)	146	515	387	233	27	-	-	-	-	1,308
	8,921,361	28,671,644	22,065,955	13,129,529	1,565,646	-	-	-	-	74,354,135
[40-44)	99	360	284	230	100	12	-	-	-	1,085
	6,551,620	21,535,162	17,019,687	13,974,816	6,618,933	709,133	-	-	-	66,409,351
[45-49)	76	253	249	218	128	102	12	-	-	1,038
	4,931,335	14,303,765	15,331,440	14,848,608	8,501,988	6,811,881	870,272	-	-	65,599,289
[50-54)	55	245	235	197	102	85	70	5	-	994
	3,793,483	14,936,866	14,115,813	13,275,446	6,611,896	5,617,250	5,261,435	354,490	-	63,966,679
[55-59)	52	209	226	165	116	94	43	21	1	927
	3,857,448	13,763,239	14,512,265	10,932,492	7,248,228	6,635,152	3,315,874	1,529,003	61,478	61,855,179
[60-64)	41	133	157	138	64	59	53	59	34	738
	2,785,347	9,250,322	11,483,587	9,841,181	3,903,525	3,872,944	4,327,222	5,835,046	3,989,074	55,288,248
[65-69)	5	60	80	67	47	39	48	41	49	436
	272,192	3,571,042	5,543,155	5,079,269	3,052,788	2,407,013	4,011,476	4,306,499	5,297,773	33,541,207
[70+	7	18	35	33	21	16	17	38	42	227
	524,180	966,815	2,189,785	2,770,537	1,364,682	1,097,036	1,636,543	4,592,519	5,073,923	20,216,020
TOTAL	991	2,936	2,010	1,310	605	407	243	164	126	8,792
	$ 56,754,648	159,340,815	119,742,724	85,381,265	38,867,686	27,150,409	19,422,822	16,617,557	14,422,248	$ 537,700,174

AVERAGES		
	Attained Age	45.79
	Service Years	8.64
	Annual Salary	$61,158

TRSL MEMBERSHIP PROFILE
Active - School Lunch Plan A

CELLS DEPICT **Member Count**
Total Salary

Valuation Date **6/30/2016**

Age/Service	[0-1)	[1-5)	[5-10)	[10-15)	[15-20)	[20-25)	[25-30)	[30-35)	[35+	TOTAL
[0-24)	-	-	-	-	-	-	-	-	-	-
	$ -	-	-	-	-	-	-	-	-	$ -
[25-29)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[30-34)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[35-39)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[40-44)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[45-49)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[50-54)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[55-59)	-	-	-	-	-	-	-	-	1	1
	-	-	-	-	-	-	-	-	24,816	24,816
[60-64)	-	-	-	-	-	-	-	2	1	3
	-	-	-	-	-	-	-	34,719	30,643	65,362
[65-69)	-	-	-	-	-	-	1	-	-	1
	-	-	-	-	-	-	27,795	-	-	27,795
[70+	-	-	-	-	-	-	-	1	2	3
	-	-	-	-	-	-	-	18,739	52,393	71,132
TOTAL	-	-	-	-	-	-	1	3	4	8
	$ -	-	-	-	-	-	27,795	53,458	107,852	$ 189,105

AVERAGES		
	Attained Age	64.41
	Service Years	33.29
	Annual Salary	$23,638

TRSL MEMBERSHIP PROFILE
Active - School Lunch Plan B

CELLS DEPICT **Member Count**
Total Salary

Valuation Date **6/30/2016**

Age/Service	[0-1)	[1-5)	[5-10)	[10-15)	[15-20)	[20-25)	[25-30)	[30-35)	[35+	TOTAL
[0-24)	9	4	-	-	-	-	-	-	-	13
	$ 168,898	61,186	-	-	-	-	-	-	-	$ 230,084
[25-29)	7	15	1	-	-	-	-	-	-	23
	176,513	263,353	18,481	-	-	-	-	-	-	458,347
[30-34)	5	28	13	-	-	-	-	-	-	46
	127,238	460,357	236,866	-	-	-	-	-	-	824,461
[35-39)	5	49	19	8	1	-	-	-	-	82
	82,936	841,227	376,575	156,230	22,197	-	-	-	-	1,479,165
[40-44)	4	38	27	16	3	1	-	-	-	89
	78,795	655,263	531,600	326,041	60,933	14,047	-	-	-	1,666,679
[45-49)	13	48	57	31	17	7	2	-	-	175
	246,264	794,596	1,057,417	634,762	386,957	171,933	39,557	-	-	3,331,486
[50-54)	7	75	74	51	53	20	5	6	-	291
	128,742	1,286,834	1,343,594	1,014,657	1,069,166	392,443	108,006	147,488	-	5,490,930
[55-59)	17	56	64	44	48	35	25	3	1	293
	400,239	945,161	1,117,637	853,709	1,050,259	752,691	566,721	66,731	24,981	5,778,129
[60-64)	3	27	28	18	12	7	5	2	-	102
	52,398	446,458	498,268	319,680	228,988	230,202	102,521	37,140	-	1,915,655
[65-69)	3	11	12	4	3	1	1	-	-	35
	51,905	172,637	206,022	82,114	53,170	85,499	73,656	-	-	725,003
[70+	-	2	7	2	-	-	2	-	-	13
	-	25,721	117,917	33,004	-	-	35,682	-	-	212,324
TOTAL	73	353	302	174	137	71	40	11	1	1,162
	$ 1,513,926	5,952,793	5,504,377	3,420,197	2,871,670	1,646,815	926,143	251,359	24,981	$ 22,112,261

AVERAGES		
	Attained Age	51.25
	Service Years	9.41
	Annual Salary	$19,029

TRSL MEMBERSHIP PROFILE
DROP Participants

Age/Years Retired	[0-1)	[1-2)	[2-3)	[3-4)	[4-5)	[5-10)	[10-15)	[15-20)	[20+	TOTAL
[0-40)	-	-	-	-	-	-	-	-	-	-
	$ -	-	-	-	-	-	-	-	-	$ -
[40-44)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[45-49)	3	1	-	-	-	-	-	-	-	4
	96,408	20,196	-	-	-	-	-	-	-	116,604
[50-54)	211	215	116	4	-	-	-	-	-	546
	9,456,252	9,236,736	4,877,520	158,568	-	-	-	-	-	23,729,076
[55-59)	458	442	392	15	-	-	-	-	-	1,307
	15,827,988	15,039,636	14,725,776	766,956	-	-	-	-	-	46,360,356
[60-64)	188	217	224	4	-	-	-	-	-	633
	3,878,772	4,640,316	5,075,436	120,036	-	-	-	-	-	13,714,560
[65-69)	3	5	4	1	-	-	-	-	-	13
	17,196	25,944	35,796	20,352	-	-	-	-	-	99,288
[70-74)	-	1	-	-	-	-	-	-	-	1
	-	3,168	-	-	-	-	-	-	-	3,168
[75-79)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[80-84)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[85-89)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[90+	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
TOTAL	863	881	736	24	-	-	-	-	-	2,504
	$ 29,276,616	28,965,996	24,714,528	1,065,912	-	-	-	-	-	$ 84,023,052

AVERAGES		
	Attained Age	57.40
	Years Retired	1.36
	Yearly Benefit	$33,556

TRSL MEMBERSHIP PROFILE
Active After DROP

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

Valuation Date **6/30/2016**

Age/Credited Service	[0-1)	[1-2)	[2-3)	[3-4)	[4-5)	[5-10)	[10-15)	[15-20)	[20+	TOTAL
[0-45)	-	-	-	-	-	-	-	-	-	-
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
[45-49)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[50-54)	13	4	3	2	-	-	-	-	-	22
	118,966	194,865	99,720	76,950	-	-	-	-	-	490,501
	482,124	129,900	71,136	53,904	-	-	-	-	-	737,064
[55-59)	255	194	98	75	50	29	-	-	-	701
	7,057,126	11,819,268	5,817,750	4,797,082	2,936,672	1,626,913	-	-	-	34,054,811
	10,042,380	7,824,672	3,973,920	3,169,812	1,895,124	966,156	-	-	-	27,872,064
[60-64)	139	163	125	136	106	363	12	-	-	1,044
	3,240,547	7,191,224	6,860,584	7,853,717	6,923,801	24,471,498	859,936	-	-	57,401,307
	3,284,460	3,632,784	4,057,572	4,698,792	4,115,784	13,220,436	397,608	-	-	33,407,436
[65-69)	2	12	68	78	65	261	82	2	-	570
	20,600	439,004	2,760,890	3,670,791	2,809,140	15,204,238	6,285,950	103,452	-	31,294,065
	6,996	116,292	1,143,108	1,621,860	1,070,280	6,859,992	2,809,056	36,984	-	13,664,568
[70+	2	2	2	4	3	83	114	44	4	258
	132,761	46,021	38,331	208,521	115,461	3,700,399	7,467,744	3,673,479	407,421	15,790,138
	101,544	8,856	7,080	36,480	19,284	1,205,508	2,725,548	1,304,868	157,572	5,566,740
TOTAL	411	375	296	295	224	736	208	46	4	2,595
	$ 10,570,000	$ 19,690,382	$ 15,577,275	$ 16,607,061	$ 12,785,074	$ 45,003,048	$ 14,613,630	$ 3,776,931	$ 407,421	$ 139,030,822
	$ 13,917,504	$ 11,712,504	$ 9,252,816	$ 9,580,848	$ 7,100,472	$ 22,252,092	$ 5,932,212	$ 1,341,852	$ 157,572	$ 81,247,872

AVERAGES

Attained Age	63.18
Service Years	4.59
Annual Salary	$53,576
Yearly Benefit	$31,309

TRSL MEMBERSHIP PROFILE
Regular Retirees

CELLS DEPICT **Member Count**
Total Benefits

Valuation Date **6/30/2016**

Age/Years Retired	[0-1)	[1-2)	[2-3)	[3-4)	[4-5)	[5-10)	[10-15)	[15-20)	[20+	TOTAL
[0-40)	-	-	-	-	-	-	-	-	-	-
	$ -	-	-	-	-	-	-	-	-	$ -
[40-44)	30	14	12	4	-	1	-	1	-	62
	637,524	297,804	214,164	99,840	-	14,904	-	27,276	-	1,291,512
[45-49)	78	91	94	109	64	54	4	-	-	494
	1,793,568	2,159,268	2,014,464	2,392,992	1,368,612	1,085,136	39,744	-	-	10,853,784
[50-54)	155	160	147	181	132	250	104	3	1	1,133
	5,081,772	4,852,140	3,826,272	4,440,672	3,091,320	5,175,336	1,618,896	14,160	1,416	28,101,984
[55-59)	596	675	612	577	353	557	468	176	6	4,020
	21,625,056	24,997,968	22,518,108	20,940,216	12,153,048	15,340,224	7,815,888	2,226,816	38,832	127,656,156
[60-64)	789	921	1,172	1,336	1,208	3,669	1,338	705	286	11,424
	20,548,896	26,267,448	36,917,316	44,526,672	40,863,624	122,816,112	31,365,240	10,007,736	3,298,968	336,612,012
[65-69)	497	610	783	1,080	1,094	4,759	4,950	1,064	1,040	15,877
	12,893,472	16,803,204	21,603,840	30,664,788	30,613,548	137,743,728	150,432,888	20,683,056	13,938,912	435,377,436
[70-74)	88	169	214	259	346	2,156	4,402	2,744	1,385	11,763
	2,754,096	5,284,008	6,502,164	7,747,356	10,076,664	57,620,532	114,992,916	76,561,836	22,810,392	304,349,964
[75-79)	38	55	55	73	92	648	2,049	2,889	2,689	8,588
	1,251,852	1,849,680	1,865,112	2,169,528	2,880,264	19,223,736	49,972,992	70,510,200	63,108,444	212,831,808
[80-84)	16	15	11	14	19	174	543	1,391	3,934	6,117
	327,888	200,400	303,096	456,912	832,140	5,517,984	14,495,316	32,565,588	88,310,448	143,009,772
[85-89)	13	3	3	2	3	40	102	326	2,921	3,413
	247,728	211,536	41,568	45,120	72,228	1,608,288	2,896,236	8,341,836	58,155,492	71,620,032
[90+	2	-	-	3	2	5	13	40	1,637	1,702
	$ 37,980	-	-	77,268	43,212	82,344	397,560	885,660	28,230,456	$ 29,754,480
TOTAL	2,302	2,713	3,103	3,638	3,313	12,313	13,973	9,339	13,899	64,593
	$ 67,199,832	82,923,456	95,806,104	113,561,364	101,994,660	366,228,324	374,027,676	221,824,164	277,893,360	$ 1,701,458,940

AVERAGES

Attained Age	70.97
Years Retired	12.85
Yearly Benefit	$26,341

TRSL MEMBERSHIP PROFILE
Disability Retirees

CELLS DEPICT **Member Count**
Total Benefits

Valuation Date **6/30/2016**

Age/Years Retired	[0-1)	[1-2)	[2-3)	[3-4)	[4-5)	[5-10)	[10-14)	[15-20)	[20+	TOTAL
[0-40)	15	13	7	3	4	7	-	-	-	49
	$ 249,516	208,860	128,544	51,768	47,472	97,428	-	-	-	$ 783,588
[40-44)	12	8	11	6	8	23	3	-	-	71
	277,200	193,608	243,660	111,324	126,012	339,924	33,612	-	-	1,325,340
[45-49)	27	28	27	21	15	40	24	7	2	191
	620,268	732,132	560,568	459,372	373,284	649,524	303,816	64,728	22,236	3,785,928
[50-54)	48	43	22	39	23	89	42	30	9	345
	719,568	736,572	422,664	637,128	357,864	1,494,276	472,284	299,136	94,164	5,233,656
[55-59)	54	42	41	44	40	134	117	68	40	580
	862,428	647,100	645,840	760,176	627,912	1,818,276	1,450,152	776,148	406,944	7,994,976
[60-64)	17	33	40	41	32	185	176	99	126	749
	252,372	496,080	594,144	691,704	429,552	2,571,396	2,049,708	1,080,444	1,433,664	9,599,064
[65-69)	5	11	10	19	9	165	242	158	231	850
	89,976	160,464	167,328	234,132	154,716	2,110,044	2,733,432	1,629,084	2,752,284	10,031,460
[70-74)	2	4	1	2	3	36	130	182	263	623
	22,632	72,552	11,016	18,756	31,812	489,024	1,466,184	1,852,632	2,932,644	6,897,252
[75-79)	-	-	1	-	-	4	19	95	298	417
	-	-	11,484	-	-	48,144	203,568	863,844	3,026,940	4,153,980
[80-84)	-	-	-	-	-	-	12	9	212	233
	-	-	-	-	-	-	103,932	80,304	2,201,112	2,385,348
[85-89)	-	-	-	-	-	-	-	3	81	84
	-	-	-	-	-	-	-	52,200	784,848	837,048
[90+	-	-	-	-	-	-	-	-	46	46
	-	-	-	-	-	-	-	-	497,436	$ 497,436
TOTAL	180	182	160	175	134	683	765	651	1,308	4,238
	$ 3,093,960	3,247,368	2,785,248	2,964,360	2,148,624	9,618,036	8,816,688	6,698,520	14,152,272	$ 53,525,076

AVERAGES		
	Attained Age	65.58
	Years Retired	14.92
	Yearly Benefit	$12,630

TRSL MEMBERSHIP PROFILE
Survivor Benefits

CELLS DEPICT **Member Count**
Total Benefits

Valuation Date **6/30/2016**

Age/Years Retired	[0-1)	[1-2)	[2-3)	[3-4)	[4-5)	[5-10)	[10-14)	[15-20)	[20+	TOTAL
[0-40)	34	45	40	55	27	113	51	27	5	397
	$ 446,580	569,532	519,228	711,648	345,492	1,358,844	458,796	262,764	58,308	$ 4,731,192
[40-44)	9	9	13	8	7	22	17	9	5	99
	132,804	97,716	157,908	129,444	154,032	297,324	246,780	123,600	56,328	1,395,936
[45-49)	18	21	14	13	13	49	33	26	12	199
	295,548	290,820	146,592	220,860	192,996	643,452	409,140	268,632	133,788	2,601,828
[50-54)	14	15	19	17	13	68	54	39	20	259
	181,092	149,760	210,744	353,760	127,944	661,764	806,424	435,984	315,000	3,242,472
[55-59)	32	31	29	23	25	108	67	49	31	395
	602,880	560,028	427,272	307,668	473,364	1,576,308	1,008,816	630,996	337,056	5,924,388
[60-64)	40	39	53	29	41	141	91	73	64	571
	911,604	1,127,544	1,641,864	699,672	927,000	2,879,004	1,581,012	992,832	765,780	11,526,312
[65-69)	60	77	72	74	50	247	157	101	111	949
	1,772,424	1,775,976	1,843,644	1,709,556	1,154,496	5,987,616	3,024,288	1,795,764	1,617,684	20,681,448
[70-74)	52	63	64	60	54	207	153	129	153	935
	1,524,000	1,362,552	1,671,480	1,306,104	1,245,816	4,660,152	3,391,140	2,555,544	2,399,448	20,116,236
[75-79)	90	72	66	64	65	249	189	137	208	1,140
	2,025,672	1,866,576	1,666,404	1,491,228	1,661,508	5,683,260	3,946,272	3,078,216	3,601,020	25,020,156
[80-84)	54	63	47	49	69	202	150	134	244	1,012
	1,090,416	1,466,496	1,254,972	1,108,884	1,308,012	3,694,128	3,065,364	2,692,620	4,104,288	19,785,180
[85-89)	37	41	43	38	27	145	102	64	156	653
	726,336	841,584	592,944	660,768	435,300	2,548,200	1,896,048	1,208,172	2,621,484	11,530,836
[90+	14	17	17	18	16	63	66	53	124	388
	221,316	270,408	267,180	276,984	221,268	942,000	1,014,480	822,168	1,878,276	5,914,080
TOTAL	454	493	477	448	407	1,614	1,130	841	1,133	6,997
	$ 9,930,672	10,378,992	10,400,232	8,976,576	8,247,228	30,932,052	20,848,560	14,867,292	17,888,460	$ 132,470,064

AVERAGES		
	Attained Age	70.43
	Years Retired	11.04
	Yearly Benefit	$18,932

TRSL MEMBERSHIP PROFILE
Vested Terminations

CELLS DEPICT **Member Count**
Total Benefit

Valuation Date **6/30/2016**

Age/Service	[0-1)	[1-5)	[5-10)	[10-15)	[15-20)	[20-25)	[25-30)	[30-35)	[35+	TOTAL
<20	-	-	-	-	-	-	-	-	-	-
	$ -	-	-	-	-	-	-	-	-	$ -
[20-25)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[25-29)	-	-	46	-	-	-	-	-	-	46
	-	-	280,007	-	-	-	-	-	-	280,007
[30-34)	-	-	633	14	-	-	-	-	-	647
	-	-	4,653,977	173,101	-	-	-	-	-	4,827,077
[35-39)	-	2	746	237	8	-	-	-	-	993
	-	8,750	5,736,535	3,355,956	167,210	-	-	-	-	9,268,451
[40-44)	1	5	711	288	79	3	-	-	-	1,087
	537	13,302	5,180,830	3,983,019	1,453,113	63,556	-	-	-	10,694,356
[45-49)	-	5	691	334	107	13	-	-	-	1,150
	-	18,102	4,578,069	4,089,003	1,949,293	324,361	-	-	-	10,958,828
[50-54)	-	4	577	363	136	23	12	-	-	1,115
	-	9,016	3,726,068	3,943,613	2,081,894	534,311	395,687	-	-	10,690,589
[55-59)	-	4	550	416	167	17	7	1	-	1,162
	-	7,638	3,556,160	4,315,084	2,368,877	403,639	215,542	45,975	-	10,912,916
[60-64)	2	2	169	94	40	16	5	-	-	328
	490	3,640	967,164	912,597	547,599	427,526	76,347	-	-	2,935,362
[65-69)	-	2	45	29	9	4	2	1	-	92
	-	1,280	221,670	239,343	124,433	94,864	42,582	40,484	-	764,656
[70+	-	-	25	16	9	8	3	4	2	67
	-	-	133,603	96,556	82,687	210,009	81,006	86,618	63,664	754,143
TOTAL	3	24	4,193	1,791	555	84	29	6	2	6,687
	$ 1,027	61,727	29,034,083	21,108,271	8,775,106	2,058,266	811,165	173,077	63,664	$ 62,086,385

AVERAGES		
	Attained Age	47.49
	Service Years	9.52
	Yearly Benefit	$9,285

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 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 and 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 for retirement ages as follows:

Age	Maximum	Age	Maximum	Age	Maximum
48	$ 63,236	56	$ 123,573	64	$ 210,000
49	68,621	57	134,737	65	210,000
50	74,504	58	147,011	66	210,000
51	80,937	59	160,525	67	210,000
52	87,975	60	175,424	68	210,000
53	95,683	61	191,862	69	210,000
54	104,132	62	210,000	70	210,000
55	113,401	63	210,000		

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 BEBEFITS:

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:

1. **Projected Employer Dollar Contribution for FYE 2016** − The June 30, 2014 valuation established the projected employer contribution rate for FYE 2016. The projected dollar contribution for FYE 2016 is equal to the projected employer contribution rate, multiplied by the projected active member payroll for FYE 2016.

2. **Actual Employer Dollar Contribution for FYE 2016** – Actual dollar contributions for FYE 2016 are obtained from system financial statements.

3. **Contribution Variance** – The difference between the Actual Dollar Contribution for FYE 2017 and the Projected Dollar Contribution for FYE 2016, adjusted for investment earnings, is equal to the Contribution Variance. A positive variance means that a contribution surplus occurred for FYE 2016. A negative variance indicates a contribution shortfall or deficit.

4. **Actuarially Determined Employer Contribution Rate for FYE 2017** – The actuarially determined contribution rate for FYE 2017 is determined by the June 30, 2016 valuation. The normal cost rate for FYE 2017 is equal to the dollar normal cost for FYE 2017 divided by the projected payroll for FYE 2017. The amortization cost rate for FYE 2017 is equal to the sum of all amortization payments for FYE 2017 divided by the projected payroll for FYE 2017. The total contribution rate is the sum of the normal cost rate and the amortization cost rate.

5. **Actuarially Determined Employer Dollar Contribution for FYE 2017** – The actuarially determined employer dollar contribution for FYE 2017 is determined by the June 30, 2016 actuarial valuation and is equal to the actuarially determined employer contribution rate for FYE 2017 multiplied by the projected payroll for FYE 2017.

6. **Projected Employer Contribution Rate for FYE 2018** − The June 30, 2016 valuation establishes the projected employer contribution rate for FYE 2018. The rate is equal to the projected employer dollar contribution for FYE 2018 divided by the projected active member payroll for FYE 2018.

7. **Projected Employer Dollar Contribution for FYE 2018** − The June 30, 2016 valuation establishes the projected employer contribution for FYE 2018. It is equal to the projected employer contribution rate multiplied by the projected active member payroll for FYE 2018.

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:

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

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

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

4. 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.

5. 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.

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

    a. 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.

b. 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.

c. 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.

d. 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.

7. 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:

1. Some UAL bases have amortization periods that are longer than 25 years.
2. 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, 2016, the preliminary actuarial value is equal to the market value of assets on June 30, 2012, plus 80% of investment gains/losses for FYE 2013, plus 60% of investment gains/losses for FYE 2014, plus 40% of investment gains/losses for FYE 2015, plus 20% of investment gains/losses for FYE 2016.

If the preliminary actuarial value of assets exceeds 120% of the market value on June 30, 2016, 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.

We have prepared our employer contribution requirements for FYE 2018 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, 2016 was within 0.01% of the value produced by Foster & Foster. In aggregate, our normal cost value for FYE 2017 was within 0.05% 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 2018, accrued liability and normal cost values in our valuation for FYE 2018 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 2017 is 8.10%. The assumed rate of return used to prepare projected employer contribution requirements for FYE 2018 is 7.00%. These rates are net of investment expenses. This 7.00% rate is based on studies prepared for the LLA by Gabriel Roeder Smith. Please refer to Appendix C – *Basis For Economic Assumptions* for further details.

The Cost of the Gain Sharing/COLA Program

For FYE 2017, the cost of the TRSL's gain sharing/COLA program is estimated to be equivalent to a 25 basis point reduction to the assumed rate of return on the actuarial value of assets. This estimate is based on discussions with Foster & Foster, the actuary for TRSL, reflecting retrospective calculations of Experience Account transfer payments when treated as an investment loss.

Effective beginning for FYE 2018, 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.

Administrative Expenses

For FYE 2017, 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. This estimate is based on the calculations by Foster & Foster and our own calculations.

Effective beginning for FYE 2018, administrative expenses have been accounted for in this valuation by directly recognizing them in the normal cost in accordance with Actuarial Standards of Practice. Please refer to Appendix D – *Basis For Treatment of Administrative Expenses* for further details.

Assumed Discount Rate

The discount rate used in the preparation of actuarially calculated employer contributions for FYE 2017 is 7.75%. This is equal to the assumed rate of return on the actuarial value of assets (8.10%) minus the cost of the gain sharing/COLA program (25 basis points as determined by the TRSL actuary) minus the cost of administrative expenses (10 basis points as determined by the TRSL actuary). The discount rate used in the preparation of projected employer contributions for FYE 2018 is 7.00%. 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 on the actuarial value of assets. It has been argued that inflation for salary growth should be based on consumer prices in the United States, but inflation for investment returns should be based on global inflation data. We have not seen any compelling evidence to support this argument. Therefore, the inflation assumption component for salary growth and for investments has been set at 2.50% in the preparation of employer contribution requirements for FYE 2017. The inflation component used to determine employer contribution requirements for FYE 2018 is 2.25%. Please refer to Appendix C – *Basis For Economic Assumptions* for details regarding the basis for the selection of the rate of inflation for FYE 2018.

Mortality Assumption

For FYE 2017, pre-retirement deaths and post-retirement life expectancies are based on attained age using the RP-2000 table with mortality improvement projected through 2025 using Scale AA. No mortality improvement is assumed to occur after FYE 2025. This table appears to match recent experience for retirement system members. This table was recommended by the system actuary and was approved by the TRSL's board of trustees.

Effective beginning for FYE 2018, the mortality assumption has been updated to the RP-2014 mortality tables with mortality improvement projected using the MP-2016 improvement scale (published in 2016), incorporating TRSL-derived mortality experience factors. 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 2017 and of 2.25% effective beginning for FYE 2018, 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%

Capital Market Assumptions

The assumed investment return on the actuarial value of assets used in the preparation of June 30, 2016 liabilities and contribution requirements for FYE 2017 is 8.10%. This rate is based in part on capital market assumptions developed by TRSL's internal professional investment staff relying substantially, but not completely, on information provided by Hewitt Ennis Knupp, TRSL's investment advisor. Capital market assumptions of investment consulting firms are considered confidential and therefore are not disclosed in this report.

The assumed investment return on the actuarial value of assets used in the preparation of projected contribution requirements for FYE 2018 is 7.00%. This rate is based on capital market assumptions for the following eight major investment firms. Once again, the capital market assumptions are considered to be confidential and are not disclosed.

BNY Mellon
Aon Hewitt
J.P. Morgan
Mercer
NEPC
Pension Consulting Alliance
R.V. Kuhns and Associates
Towers Watson

Please refer to Appendix C – *Basis For Economic Assumptions* for further details pertaining to the determination of this rate.

RP-2000 MORTALITY TABLE WITH PROJECTION TO 2025 WITH SCALE AA - Effective July 1, 2014 - FYE 2017

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 2018

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 2018

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.

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	20-24	25-29	>=30	0-4	24-May	25-29	>=30	0-4	24-May	25-29	>=30
	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
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

HIGHER EDUCATION
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	0.250	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				K-12 07/1999-12/2010				K-12 Post 01/2011			
Age	0-4	19-May	20-24	25-29	>=30	0-4	24-May	25-29	>=30	0-4	24-May	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

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 2017, rate of Inflation is assumed to be 2.50%; effective beginning for FYE 2018, 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			

APPENDIX A
CONTRIBUTION RATES FOR SUB PLANS

Appendix A: Contribution Rates for Sub Plans

The calculations of employer contribution rates for FYE 2018 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	$ 262,822,915		7.580198%
Shared Amortization Costs	1,018,287,422	$ 3,467,230,200	29.368901%
Total	$ 1,281,110,337		36.9491%

B. Higher Education Sub Plan for Non ORP Members

	Dollar Contribution	Projected Payroll	Contribution Rate
Employer Normal Cost	$ 35,784,485		6.108246%
Shared Amortization Costs	172,054,476	$ 585,838,990	29.368902%
Total	$ 207,838,961		35.4771%

C. Higher Education Sub Plan for ORP Members

	Dollar Contribution	Projected Payroll	Contribution Rate
Employer Normal Cost	$ -	$ -	0.000000%
Shared Amortization Costs	170,151,438	579,359,219	29.368901%
Total	$ 170,151,438		29.3689%

D. Total For All Sub Plans

	Dollar Contribution	Projected Payroll	Contribution Rate
Employer Normal Cost	$ 298,607,400	$ 4,053,069,190	7.367439%
Shared Amortization Costs	1,360,493,336	4,632,428,409	29.368901%
Net Employer Cost	$ 1,659,100,736		36.7363%

APPENDIX B
BASIS FOR MORTALITY ASSUMPTIONS

Plan Experience

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 with results summarized in the experience study report, dated March 27, 2013. 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	0
20-24	1,360	0	5,884	1	256	0	331	0
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	1036
85-89	0	0	0	0	3,480	422	11,809	1070
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

Process

The overall process for setting mortality assumptions when an experience study has been performed involves a few steps:

1. Determine credibility factors (either 100% credible or some lesser factor to reflect partial credibility).

2. Determine the average/composite mortality rates (a) from the experience study and (b) as expected by the published reference table.

3. Determine a new blended average/composite mortality rate for the group as a weighted average of 2(a) and 2(b), above, where the weighting is the credibility factor for the group.

4. A TRSL-derived experience factor is determined for each group as the ratio of (a) the blended average/composite mortality rate for the group to (b) average/composite mortality rate for the published reference table.

5. Apply this final adjustment factor to each age's mortality rate in the published reference table to obtain a new mortality rate for each age. These new mortality rates for each age constitute the new mortality table (before any recognition of future improvements in mortality).

This process is outlined in a Practice Note issued by the American Academy of Actuaries.[1]

Credibility

Actuarial credibility is not about whether the researcher did a good job or if the data is believable. Actuarial credibility is about how much 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 predictor of future experience and the resulting "adjustment factors" can be applied to a published reference table to obtain a new mortality table that make full use of the group's own experience. If an experience study's fully credible results indicate a material difference in mortality rates from that of a published reference table, then it is more appropriate to apply adjustment factors to the published reference table rather than just use the published reference table without regard to the group's own experience. Partial credibility means that the results cannot be blindly applied to create a new mortality table; but blended experience factors should be applied to the published reference table to obtain a new mortality table that partially reflects the groups own experience and partially reflects the published reference table.

For the purpose of this analysis, the full credibility was assigned to a confidence level of 90% of being within 5% margin from the correct value. The credibility was assessed separately for male active members, female active members, male retiree members, and female retiree members. 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 table above, the experience study is only partially credible for the male active members and female active members since their respective number of deaths is less than 1,082. However, the experience study results are fully credible for male and female retirees.

1. To calculate the credible factors for the male and female active members, the square root of the number of deaths divided by 1,082 was calculated. The resulting credibility factors are 38% for the male active members and 62% for the female active members. This means 38% and 62% of the experience study results can be taken into account in the determination of the mortality assumption for male active members and female active members, respectively.

[1] *Selecting and Documenting Mortality Assumptions for Pensions*, A Public Policy Practice Note issued by the American Academy of Actuaries (2015). https://actuary.org/files/Mortality_PN_060515_0.pdf

2. Since the male and female retiree results are fully credible, the credibility factors for male and female retirees are therefore 100% for both the male active members and the female active members. This means 100% of the experience results can be used in the determination of the mortality assumption for male retiree members and female retiree members.

RP-2014/MP-2016

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 of the Society of Actuaries. These were published in October 2014. These tables constitute the most recent reliable tables available.

The RP-2014 mortality tables are therefore used as the reference tables in determining the mortality assumption.

The following table shows the mortality rates (the probability of death during the following one year, at a given age) based on the RP-2014 healthy life mortality tables for different ages:

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%

It is not preferable to ignore credible data from a group's own experience study and simply use the published 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 to develop experience-based tables with a standard mortality improvement scale.

This was achieved by multiplying each of the mortality rates (probability of death) for each age in the published reference table by the TRSL-derived experience factors.

TRSL-derived experience factors

TRSL-derived experience factors to be applied to the RP-2014 mortality tables were calculated separately for male active members, female active members, male retiree members, and female retiree members. To do so, the RP-2014 mortality tables were projected backward to 2010 (using projection scale MP-2014) to match the central year of the experience study. The average mortality rate from the experience study was then blended (if applicable) for each group with the average mortality rate from the reference table using the appropriate credibility factor. Finally, the ratio of the average blended mortality rate divided by the average mortality rate of the RP-2014 mortality table projected backward to 2010 was calculated for each group.

1. For male actives members, the TRSL-derived experience factor is 101%. That ratio was calculated by dividing the average blended mortality rate (0.217%) by the average mortality rate of the RP-2014 mortality table projected backward to 2010 (0.215%).

2. For female active members, the TRSL-derived experience factor is 88%. That ratio was calculated by dividing the average blended mortality rate (0.135%) by the average mortality rate of the RP-2014 mortality table projected backward to 2010 (0.154%).

3. For the retiree members, since the credibility factors are 100%, experience factors are based on actual mortality rates without blending. For male retiree members, the TRSL-derived experience factor is 110%. That ratio was calculated by dividing the average mortality rate of the experience study (2.87%) by the average mortality rate of the RP-2014 mortality table projected backward to 2010 (2.62%).

4. For female retiree members, the TRSL-derived experience factor is 99%. That ratio was calculated by dividing the average mortality rate of the experience study (2.04%) by the average mortality rate of the RP-2014 mortality table projected backward to 2010 (2.07%).

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 mortality rates from the raw results of the experience study, (b) the average mortality rate assumed by TRL's actuary using the older RP-2000 table projected to 2025 with the older Scale AA and (c) the average 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 mortality rate is very close to the one from the experience study since the experience study was largely credible and was incorporated in the determination of the mortality assumption.

Reflecting higher mortality rates as compared to the average mortality rate from TRSL's actuary resulted in an initial decrease in costs and liabilities. However, after applying the mortality improvement scale MP-2016 to the RP-2014 tables, the overall costs and liabilities increased as compared to the liability from TRSL's actuary.

MP-2016 Improvement Scale

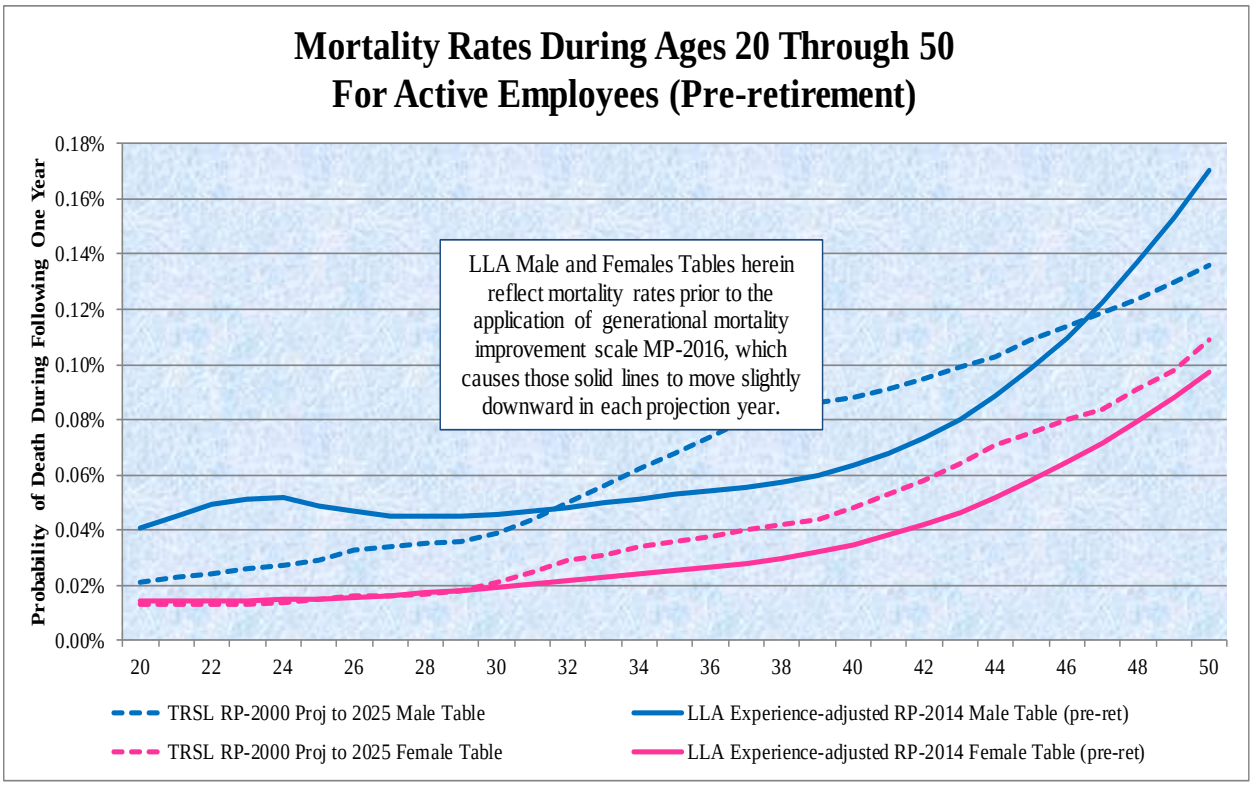
The improvement scale projects the mortality rates from the base year (2014) of the mortality table to future years to account for future improvement in the mortality rates. The MP-2016 improvement scale, released in October 2016, is intended to be used along with the RP-2014 mortality tables and is the most recent improvement scale available. The MP-2016 improvement scale is therefore used. This is an improvement design designed to apply generationally, not just projected to a given future year.

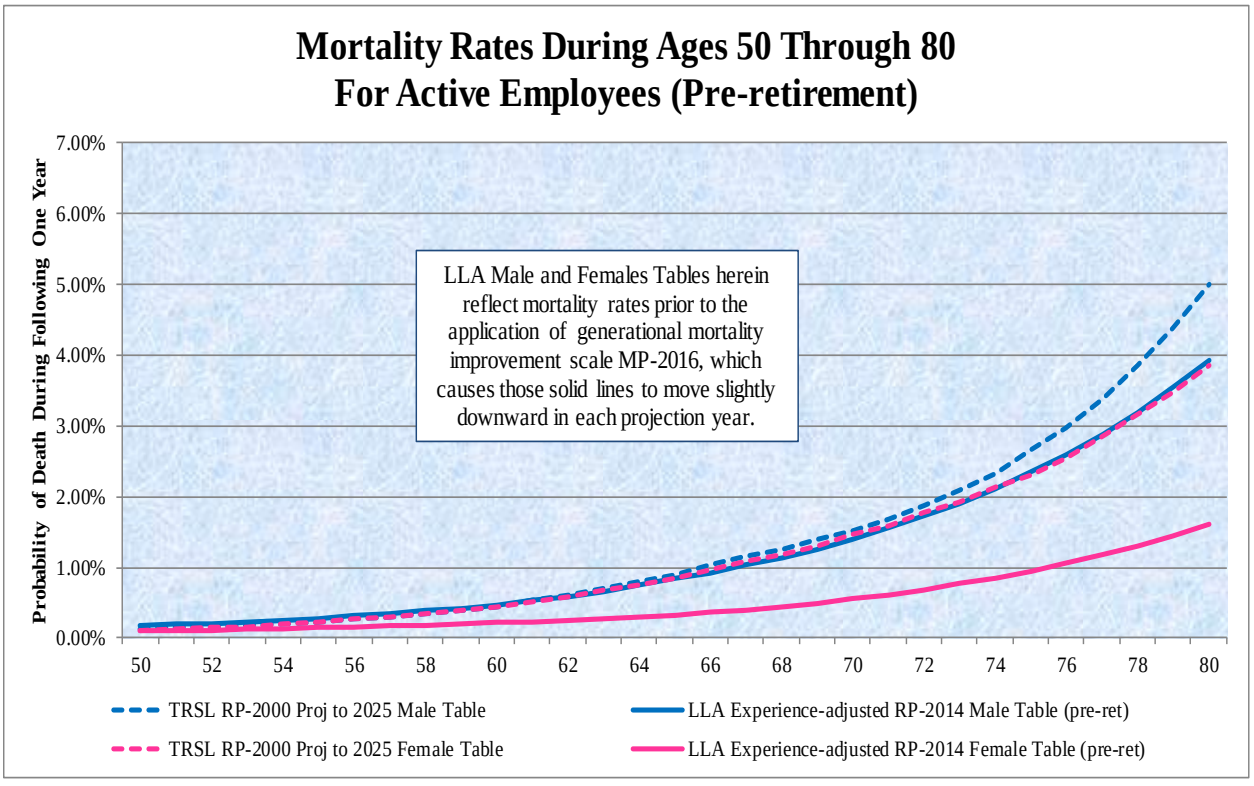
Four graphs on the following pages show the mortality rates for the current mortality assumption (RP-2000 mortality tables projected to 2025 with improvement scale AA) and the new mortality assumption (Experience-adjusted RP-2014 mortality tables) prior to the application of the MP-2016 improvement scale. The first two graphs show the mortality rates for active employees (males and females) for ages 20 to 50 and ages 50 to 80. The last two graphs show the mortality rates for retirees (males and females) for ages 50 to 80 and ages 80 to 100.

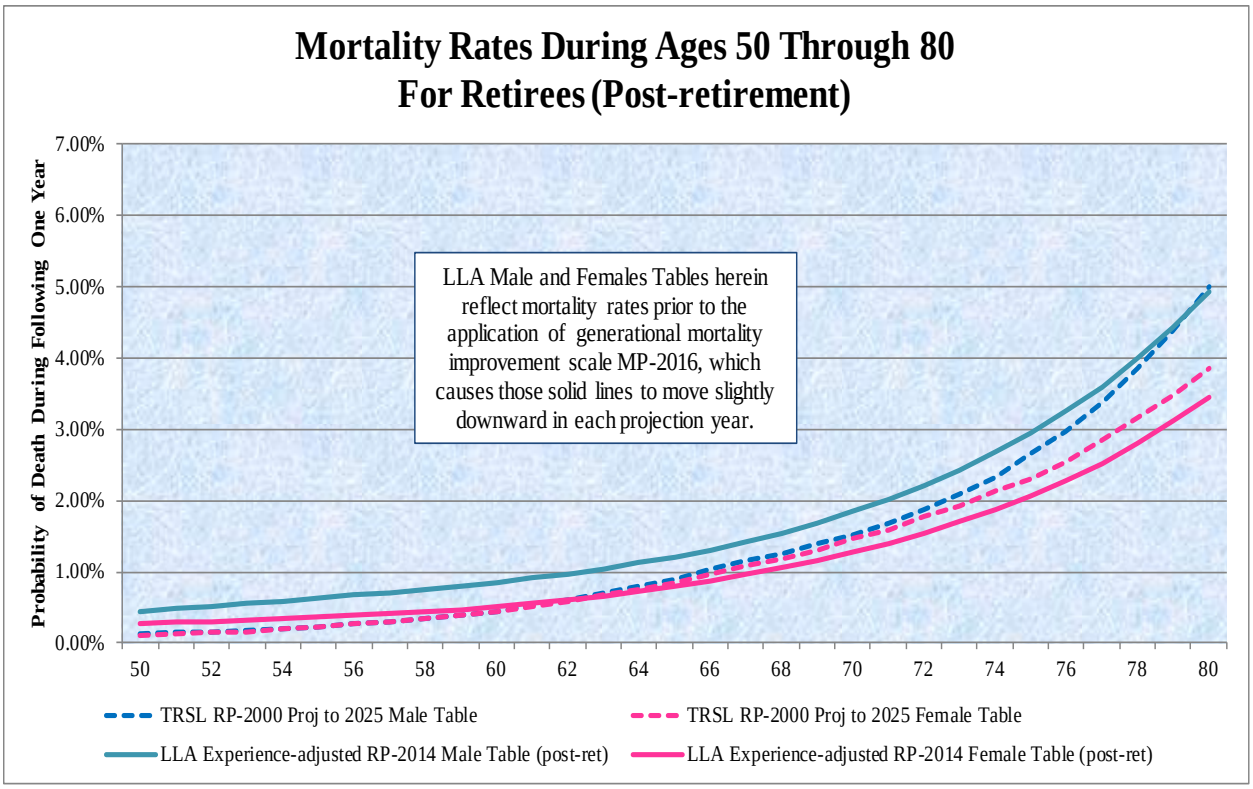
Actuarial Practice

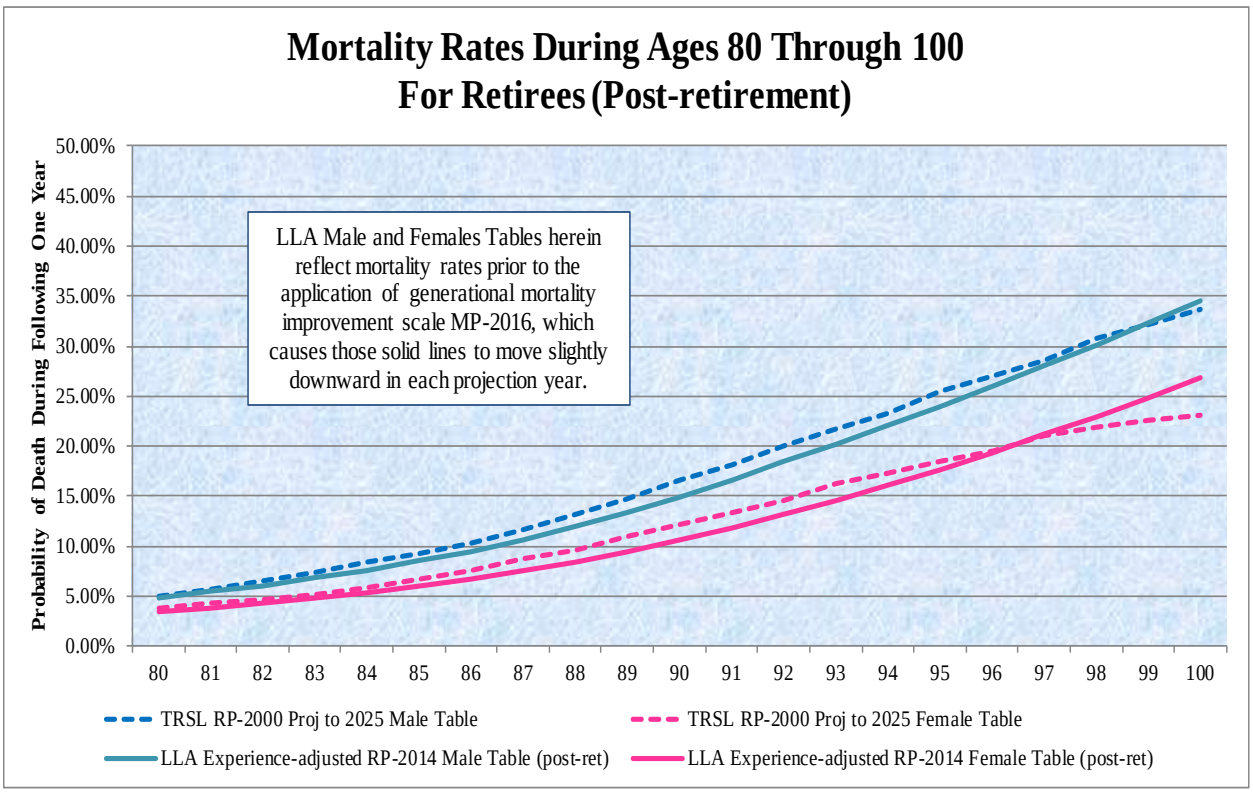
The LLA's actuary recognizes the experience studies for larger systems are generally performed every five years and the next one for TRSL is not scheduled until 2018. However, it is also generally accepted among retirement system executives, board members and actuaries that if events occur or if better 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 this new approach satisfies that ASOP for this 2016 actuarial valuation.


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
LLA Experience-adjusted RP-2014 Male Table (pre-ret)
TRSL RP-2000 Proj to 2025 Female Table
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
LLA Experience-adjusted RP-2014 Male Table (pre-ret)
TRSL RP-2000 Proj to 2025 Female Table
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

TRSL's current net investment return assumption is 8.10%, while the discount rate is 7.75%. The 8.10% is derived from adding 35 basis points back into the 7.75% discount rate to obtain the net investment return assumption.[2] Because of the manner which TRSL measures the cost of administrative expenses (by reducing the net investment return assumption by 10 basis points) and gain-sharing/cost-of-living benefits (by reducing the same by 25 basis points), the net investment return assumption is not the same as the discount rate. For TRSL there is a difference between the net investment return assumption and the discount rate – a substantial difference.

- TRSL's current net investment return assumption 8.10%
- TRSL's current discount rate 7.75%

Actuarial Standard of Practice No. 27 is devoted to the "*Selection of Economic Assumptions for Measuring Pension Obligations.*" Over one half of the document pertains to the extensive amount of data an actuary must examine before selecting an assumed rate of return. Key requirements are summarized below:

1. The actuary should review appropriate recent and long-term historical economic data without giving undue weight to recent experience.

2. The actuary should consider the views of experts – representative of the plan sponsor and administrator, investment advisors, economists, and other professionals.

3. The investment return assumption reflects the anticipated returns on the plan's current and if appropriate for the measurement, future assets.

4. The actuary should recognize the uncertain nature of the assumption selected and may consider a range of rates to be reasonable.

5. Although the actuary may incorporate the views of experts, the selection of the investment return assumption should reflect the actuary's professional judgment.

Some have argued that the net investment return assumption should be set based on either (a) how much the Board or Plan Sponsor wants the contribution to be or (b) what other plans are doing.

But the net investment return assumption is not a lever to adjust up or down based on how much the plan sponsor's budget will afford or whether benefits might be amended up or down. SEC has stated they are "specifically targeting for investigation government entities that appear to be cherry-picking assumptions."[3]

[2] Found in the 2016 TRSL actuarial valuation report prepared by the system's actuary and dated October 7, 2016. Page 5: "The returns shown below are comparable to the discount rate plus returns expected to be used to fund the experience account and administrative expenses, or 8.10%". Page 9: "The net discount rate is determined as the gross expected long-term return less investment and administrative expenses and the expected return used to provide for the future retiree benefit increases."

[3] Peter K.M. Chan, Assistant Regional Director, Chicago Regional Office, Municipal Securities and Public Pensions Unit, U.S. Securities and Exchange Commission; Presentation at the Annual Meeting of the Conference of Consulting Actuaries (October 15, 2010 and October 25, 2011).

A plan's net investment return assumption should be derived based on the plan's own asset allocation, its own investment-related expense structure and a defensible compound return expectation of the future.

Raising or lowering the net return assumption (or any other actuarial assumption) does not change the "cost" of a plan. The cost of a plan is not determined by what is assumed or expected. It is determined by what actually happens in the future. The actuarial assumptions only determine what the "contribution" is for any given year, i.e., the timing or incidence of contributions. The true cost of a plan over time is not affected by the assumptions. Suppressing the current contributions based on optimistic assumptions will likely cause escalating contributions in the future, as future investment shortfalls take their toll over the years.

The net investment return should be set as a reasonable and defensible future expectation of the compound average net return over time, given the risk/reward profile (asset allocation) and the investment-related expense structure of the plan's own portfolio.

The LLA expects a robust, disciplined and professional process from the actuary in selecting a net investment return assumption. Based on our analysis, the most appropriate rate of return assumption is 7.0%. Our analysis is organized in accordance with the following topic headings. In this actuarial valuation, the net investment return is the same as the discount rate (7.0%).

1. A Look at the Past
2. A Look to the Future
3. Opinions of Other Public Sector Actuaries

A LOOK AT THE PAST

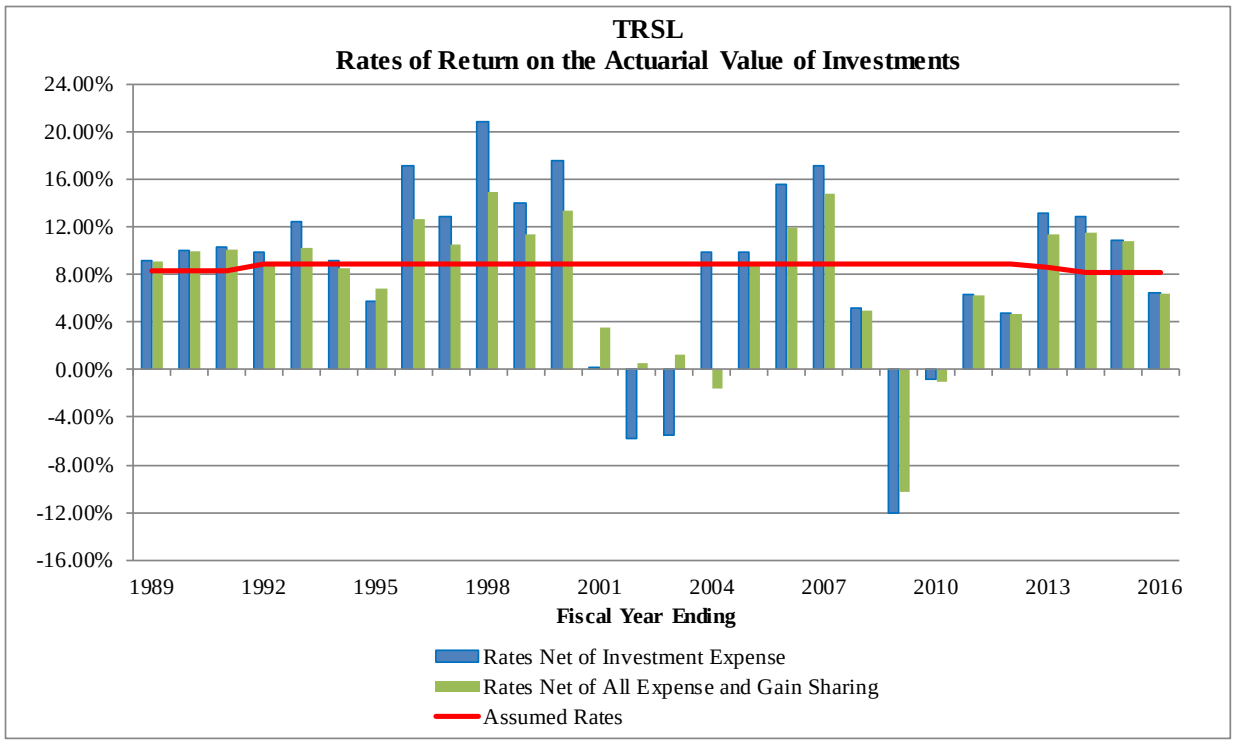
Historical Rates of Return on Investments

Actuarial rates of return on investments since 1989 are compared with assumed rates of return over the same period (see chart on the following page). The following information is important to an understanding of these graphs.

1. The red line shows assumed rates of return (not the discount rate). The assumed rate of return is the discount rate plus a margin for administrative expenses (0.10%) and a margin for gain-sharing. No margin for gain sharing was necessary prior to its enactment during the 1992 legislative session. A 50 basis point margin was assumed from 1992 through 2013. The margin was reduced to 0.25% in 2014 to reflect a major reduction in gain-sharing provisions.

2. The blue bars show the actual rate of return on investments year by year. This rate is net of investment expenses and is based on the actuarial value of assets.

3. The green bars show the actual rate of return on investments adjusted for investment gains and losses flowing to and from the Experience Account.



Historical Risk Profile of the Portfolio

Beginning in the late 1990s and early 2000s, the risk profile of the portfolio became more and more tilted toward risk-oriented asset classes (with higher expected volatility), and has remained at that higher level through 2016. The risk profile increased further in the early 2010s, only to back off slightly to the pre-2010 level. The asset allocation of the fund to various asset classes determines the appropriate investment return assumption, as addressed below. But it also determines the level of volatility-risk expected in the portfolio. That volatility-risk of the portfolio drives the volatility in the actual rates of investment return month-by-month and year-by-year.

The volatility of actual investment returns drives the volatility in the unfunded accrued liability and the employer contribution rate, even though there is a smoothing mechanism applied to translate the fair value of assets to the actuarial value of assets.

Volatility in the unfunded accrued liability (and the net pension liability on the school districts' balance sheets) can affect the credit rating, covenants, borrowing costs, contribution rates and other ramifications. Volatility in the employer contribution rates can affect budgets, grant management, taxes, credit ratings, borrowing costs and other ramifications.

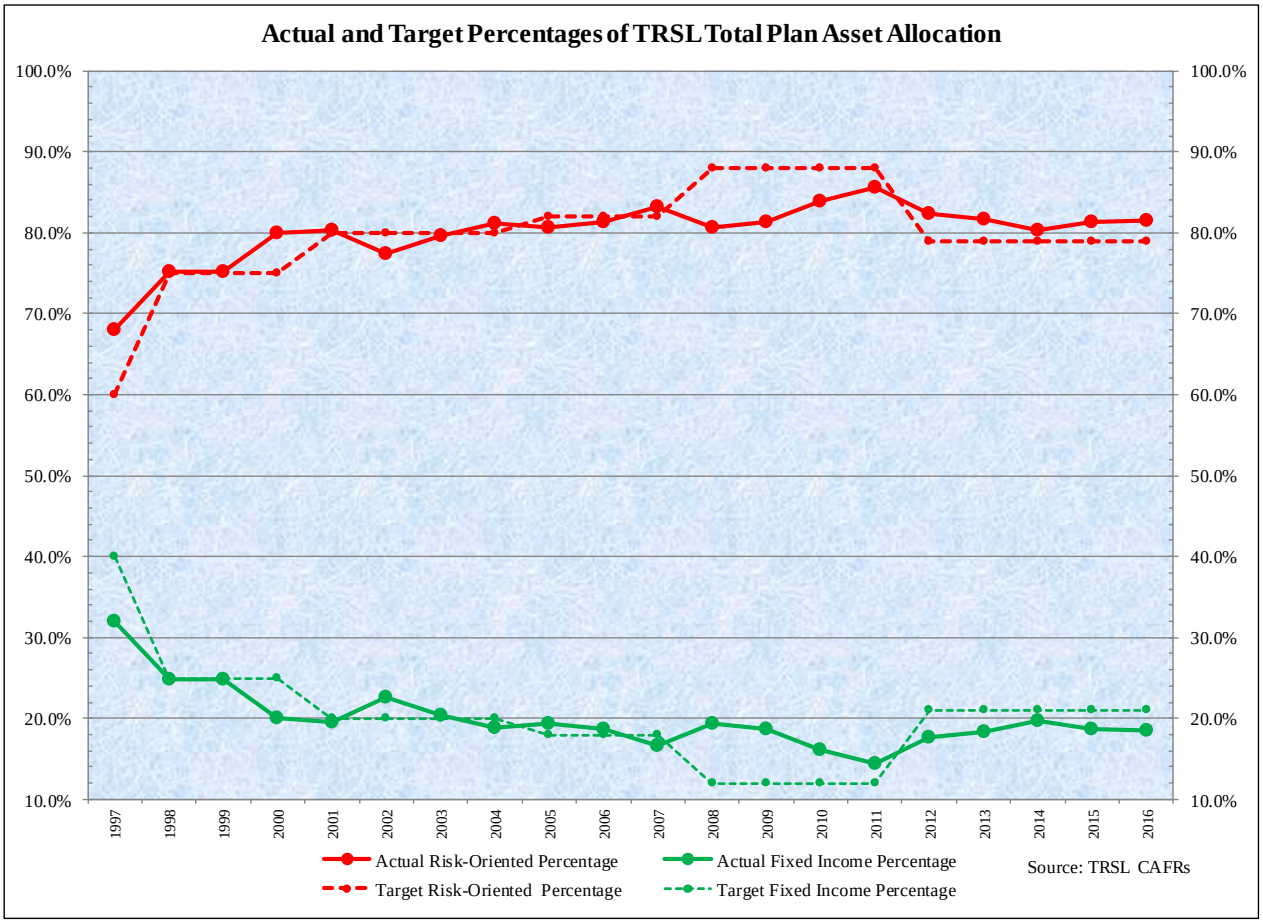
Volatility in the actual investment returns also drives more gain-sharing transfers into the experience account – more often and larger amounts. All other things being equal, a wider range (volatility) of actual investment returns causes more of the core funds to be siphoned off for gain-sharing/cost-of-living increases, leaving the core fund with less to pay for the core benefits.

Conventional wisdom tells us that more aggressive risk profiles should produce better investment returns over time. But that higher investment return expectation comes with a cost – in terms of volatility and its ramifications. This is the focus of enterprise risk management for public sector

pension plans.[4] Most pension risk management focuses on the portfolio by itself (standard deviations, Sharpe and Sortino Ratios).

Enterprise risk management is a more holistic view of risk-taking, risk measurement, risk mitigation and risk policy-setting, wherein an actuarial process melds the assets with the liabilities to inform policy-makers as they decide whether the risk profile of the portfolio is consistent with the risk tolerance of the stakeholders who pay the bill.

Consider the following graph illustrating the 20-year history of the fund's risk profile.



Observations from a Look to the Past:

1. Actual rates of return generally matched or exceeded assumed rates of return during the 1990s.

2. TRSL had very impressive rates of return from 1995 through 1999, as did most other pension funds.

3. Actual rates have generally been significantly below assumed rates over the past 15 years.

4. Cumulative actual actuarial rates of return are compared to assumed actuarial rates of return over past periods in the table below.

[4] Refer to *Risk Management and Public Plan Retirement Systems*, prepared by the Public Plans Practice Task Force of the American Academy of Actuaries, can be found at: http://www.actuary.org/pdf/pension/PPPTF_Final_Report_c.pdf

Average Compound Rate over the Past:	Actual	Assumed	Deficit*
5 Years	9.59%	8.35%	-1.24%
10 Years	6.07%	8.60%	2.53%
15 Years	5.52%	8.68%	3.16%
20 Years	7.30%	8.72%	1.42%
25 Years	7.99%	8.75%	0.76%
28 Years	8.19%	8.71%	0.52%

*A negative deficit indicates actual rates exceeded assumed rates.

5. The fund's risk profile and expected volatility has increased significantly over the past 20 years.

6. Of particular concern to us is the last 15-year period. Assumed rates have averaged 8.68% while actual rates have averaged only 5.52%. The average shortfall in earnings has led to significant losses and higher contribution requirements. One should take no comfort in the close match (even outperformance) over the last five years.

7. Over any given prior 15-year period, there have been shortfalls compared to the assumed long-term rates. Consider the immediate past 15 years (as illustrated in the graph on page C-3). Each of the three years 2001-2003 included substantial underperformance compared to the long-term assumption. Each of the five years 2008-2012 also included substantial underperformance compared to the long-term assumption. Significant shortfalls compared to the current 8.10% are expected to occur over the next 15-year period. Short-term and mid-term actual volatility and underperformance can torpedo long-term assumptions.

8. The consensus of the investment community is that the market corrections at the beginning of the century and in 2008-09 are likely to be permanent corrections. Losses that were incurred during this period are not likely to be recovered. Future returns will follow the "new normal", i.e., much lower actual returns than experienced in past years.

Conclusions:

1. TRSL has not achieved its assumed rate of return on the actuarial value of assets over the past 10, 15, 20, 25 and 28 years, with serious and unexpected consequences to the unfunded accrued liability and the employer contribution rate. The average shortfall in the investment return performance for the past 15 years has been over 300 basis points, worse than any of the other trailing periods shown.

2. The LLA's actuary has chosen to use a shorter horizon for the forecast of the investment return assumption. Too much can happen in the short-term and mid-term horizons that may create a need for even larger returns in the 15 years thereafter.

3. The LLA's actuary has lowered the net investment return assumption of from 8.10% to 7.00%. Refer to the discussion below for further support for that assumption.

4. Because of the LLA actuary's change in treatment of administrative expenses and change in the measurement of the gain-sharing/cost-of-living benefits, the discount rate is the same as our investment return assumption. This is more transparent.

A LOOK TO THE FUTURE

An analysis of historical rates of return must be complimented by an analysis of what the future may hold. Complete reliance on past experience is to assume that the future will look just like the past. Actuarial Standards of Practice No. 27 states: the actuary should consider the possibility that some historical economic data may not be appropriate in developing assumptions to future periods due to changes in the underlying environment. The term "should consider" indicates what is normally the appropriate practice for the actuary to follow when rendering actuarial services. The market place is the entire world rather than just the United States, and investment securities and opportunities are vastly different today than they were 30 years ago. The LLA's actuary concludes that TRSL's assumed rate of return on investments is too high and should be reduced.

Mid-time 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 (30-50 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 six 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. Aiming and hoping for higher returns in the long-term, while suffering underperformance in the mid-term is not sustainable. Consider what happens "in the meantime."

   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[5] 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.

   If the average compound rate of return over a 30-year period were to be 8.05% and the consensus of expert investment forecasters is expecting rates over the next 15 years to be 6.91%, then over the following 15 years, the compound return must be much higher to attain 8.05% over the 30 years. Specifically, if the first 15 averages 6.91%, then the next 15 must average 10.1% to reach 8.05% over 30 years. This places a heavy burden on the retirement system and its investment advisors and managers. The expected shortfall may cause the retirement system to increase its risk profile even further – chasing the ever-lower expected returns by taking more risks to achieve the stated goal.

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

2. *Reversion to historical means is flawed.* Forecasting over the longest-term horizons relies heavily on a reversion to historical means. The theory of reversion-to-the-historical-mean says that over long periods of time, average returns will remain approximately the same; so that average future returns will be approximately the same as the average of historical returns. The fatal flaw in that theory is that it rests on the premise that the environment in which the returns are realized will always remain the same.

   Of course, the macroeconomics of the country and the world are substantially different today than over the past 50-100 years (or even over the past 20-30 years). And the future is likely to be even more different. It is flawed reasoning to point to the historical returns as the basis for making actuarial assumptions about future investment returns for the purpose of pension valuations. This backward-looking approach is also fraught with abuse because prior periods can be selected to make average outcomes to be any desired result. Long-term forecasts depend too much on reversion to historical means.

3. *Few reputable long-term forecasts.* There are relatively few sources for the longest-term forecasts of inflation and investment returns. There are many more investment consultants and forecasters who publish mid-term horizon forecasts of inflation and returns than the longest-term. More inputs from more experts gives Board members and their advisors more confidence that the consensus range is mainstream.

4. *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, including hurricane forecasting. Long-term forecasts are less reliable than mid-term forecasts.

5. *We are not judged in the long run.* Even though pensions are long-term propositions, we live in a short-term and mid-term world. Board members and their actuaries and investment consultants are judged more in the short-term and mid-term. We should not need to wait 30 or more 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 30+ year horizon, when so many mid-term years are underperforming.

6. *The duration of the liabilities is 14.2 years*. The "duration" of the liabilities is the average length of time until each year's benefit payments, where each future year is weighted with the present value of that year's benefits. It can be thought of a weighted average length of time until benefits are paid. As of June 30, 2016, the duration of TRSL's future benefit stream is approximately 14.2 years. This speaks to the preferable use of a mid-term horizon for the future expected net return on plan assets used to pay benefits, rather than a 30-year horizon.

For these six reasons, a mid-term horizon (e.g., 10-20 years) is much more appropriate than a long-term horizon (e.g., 30+ years).

Inflation

Based on the following forward-looking sources, the LLA actuary selected 2.25% as the mid-term expected rate of inflation.

Forward-looking Annual Inflation Forecasts (From Professional Experts in the Field of Forecasting Inflation)	
Federal Reserve Board's Federal Open Market Committee	
Long-run Price Inflation Objective (Since Jan 2012)	2.00%
Congressional Budget Office: *The Budget and Economic Outlook*	
Overall Consumer Price Index (Aug 2016; Ultimate)	2.40%
Overall Consumer Price Index (Aug 2016; 11 Years)	2.33%
Personal Consumer Expenditures (Aug 2016; Ultimate)	2.00%
Personal Consumer Expenditures (Aug 2016; 11 Years)	1.95%
2016 Social Security Trustees Report	
CPI-W 15-Year Intermediate Assumption	2.50%
CPI-W 30-Year Intermediate Assumption	2.55%
GDP Deflator 15-Year Intermediate Assumption	2.13%
GDP Deflator 30-Year Intermediate Assumption	2.17%
Quarterly Survey of Professional Forecasters	
2Q2016 Federal Reserve Bank of Philadelphia 10-Year Forecast	2.20%
Federal Reserve Bank of Cleveland	
30-Year Expectation on June 1, 2016	2.04%
20-Year Expectation on June 1, 2016	1.87%
10-Year Expectation on June 1, 2016	1.63%
Bond Investors (Excess Yield of Non-indexed Treasuries Over Indexed Treasuries)	
30-Year Expectation on June 30, 2016	1.60%
Median 30-year Expectation over 1/1/11 - 6/30/16	2.28%
20-Year Expectation on June 30, 2015	1.33%
Median 20-year Expectation over 1/1/11 - 6/30/16	2.27%
10-Year Expectation on June 30, 2015	1.40%
Median 10-year Expectation over 1/1/11 - 6/30/16	2.14%
Investment Consultants and Forecasters	
2016 GRS Survey major national investment forecasters and consultants	
Median expectation among 8 firms (6 to 20 Years)	2.23%
Median expectation among 2 firms (30 Years)	2.38%
2016 HAS Survey of 12 investment advisors: Median (10 years)	2.22%
2016 HAS Survey of 12 investment advisors: Median (20 years)	2.31%

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

Studies by Gabriel, Roeder, Smith & Company Holdings, LLC (GRS)

The LLA has commissioned studies by GRS, the largest provider of actuarial services to the public sector, to help us identify an appropriate rate of return assumption. A study was initially commissioned following the June 30, 2013, actuarial valuation. The study was updated early in 2015 and again in 2016 for this actuarial valuation report. These studies were based on TRSL's asset allocation policy at the time.

Expected future investment returns of a pension fund are driven primarily by its asset allocation.

2016 TRSL Target Asset Allocation			
Risk Assets		**Fixed Income Assets**	
Large/Mid Cap US Equity	24.0%	Core US Fixed Income	12.0%
Small Cap US Equity	7.0%	High Yield Bonds	2.0%
International Equity (Developed)	11.0%	Non-US Developed Bond	4.0%
Emerging Markets Equity	8.0%	Emerging Market Bonds	3.0%
Opportunistic Real Estate	3.0%	Total Fixed Income Assets	21.0%
Real Estate (Core)	4.0%		
Commodities	2.0%		
Infrastructure	1.0%		
Corporate Finance	11.0%		
Venture Capital	2.0%		
Mezzamnine/Distressed Debt	6.0%		
Total Risk Assets	79.0%	Total Asset Allocation	100.0%

Source: TRSL Investment Policy Statement 100.31 (revised 12/04/2015)

GRS maintains an annual survey of the capital market assumptions of eight major national investment consultants and forecasters (listed alphabetically below).

Eight Major National Investment Consultants and Forecasters		
BNY/Mellon	Mercer	R.V. Kuhns & Associates
Aon Hewitt	NEPC	Wilshire Associates
J. P. Morgan	Pension Consulting Alliance	

In selecting a net investment return assumption, decision-makers need to know if the forecasts they are being provided by their investment consultant is an outlier (on the high side or the low side). Different investment forecasters have different views of the future. Currently, the spread between the most conservative and the most aggressive net return forecasts among these major national investment forecasters is 143 basis points (1.43%) for TRSL's current asset allocation.

The LLA's actuary chose to follow the mainstream consensus of respected experts.

The asset allocation above mapped to the current forecasts of the eight consultant-forecasters results in their expectations of the pension fund's compound net return over the next 15 years (see below). These returns are net of investment expenses, excluding any claim of superior

performance over broad market expectations, but recognizing the value of active management over passive. No further reductions in the return assumption have been made for administrative expenses or gain-sharing/cost-of-living adjustments. These will be recognized explicitly and transparently in the actuarial methodologies rather than implicitly.

Investment Consultant	Distribution of 15-Year Average Geometric Net Nominal Return			Probability of exceeding	Probability of exceeding	Probability of exceeding	Probability of exceeding
	40th	50th	60th	8.10%	7.75%	7.00%	7.00%
(1)	(2)	(3)	(4)	(5)	(6)	(6)	(6)
1	5.12%	6.00%	6.89%	27.56%	30.94%	38.78%	38.78%
2	5.77%	6.57%	7.37%	31.51%	35.49%	44.57%	44.57%
3	5.83%	6.71%	7.59%	34.47%	38.22%	46.62%	46.62%
4	6.19%	7.00%	7.81%	36.57%	40.72%	49.96%	49.96%
5	6.09%	6.95%	7.81%	36.80%	40.70%	49.39%	49.39%
6	6.30%	7.09%	7.88%	37.37%	41.65%	51.12%	51.12%
7	6.68%	7.57%	8.47%	44.11%	48.02%	56.46%	56.46%
8	6.37%	7.43%	8.50%	43.71%	46.99%	54.10%	54.10%
Average	**6.04%**	**6.91%**	**7.79%**	**36.51%**	**40.34%**	**48.87%**	**48.87%**
Average of Middle 6	**6.14%**	**6.98%**	**7.82%**	**36.80%**	**40.80%**	**49.68%**	**49.68%**

If the average of the eight consultants is used rather than a single consultant, there is a 50/50 chance of achieving a *compound* annual net investment return of 6.91% rate of return over the next 15 years. The probability of achieving the current 8.10% *compound* investment return assumption only 36.51%. The 50/50 expectation is a better choice.

The backup details for the investment consultants' build-up of their respective expected *1-year* nominal return, net of investment-related expenses are shown below. The results of this build-up are then converted to *compound* net return expectations over a 15-year horizon as displayed above.

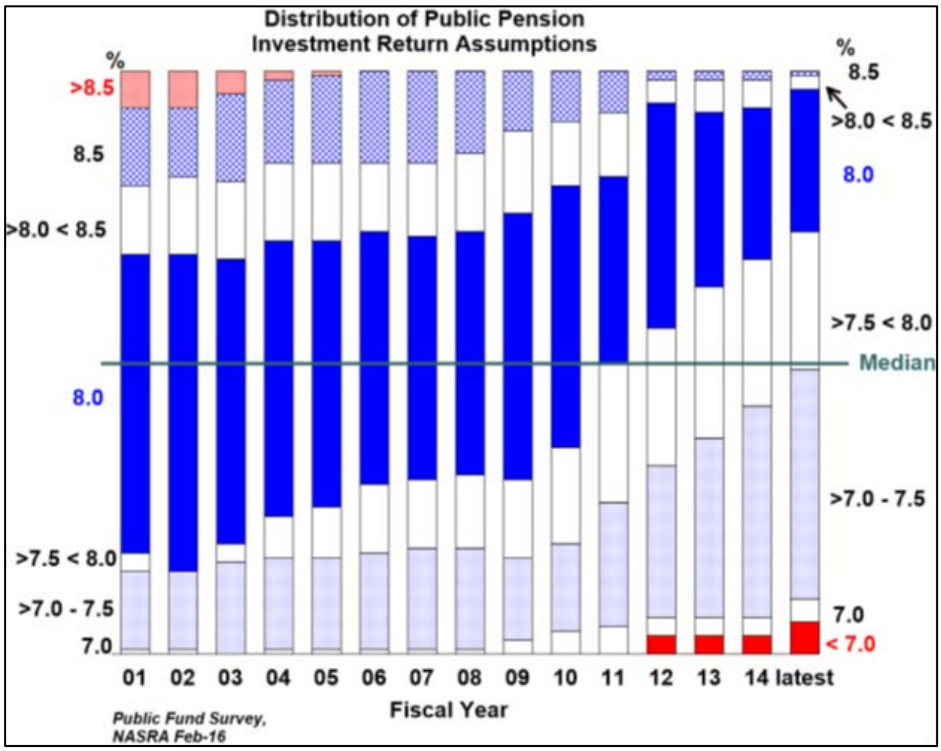
Investment Consultant	Investment Consultant Expected Nominal 1-Yr Return	Investment Consultant Inflation Assumption	Expected Real Return (2)–(3)	Actuary Inflation Assumption	Expected Nominal Return (4)+(5)	Investment and Active Management Expenses	Recognized Value for Active Management	Expected Nominal 1-Yr Return Net of Expenses (6)-(7)+(8)		Standard Deviation of Expected Return (1-Year)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)		(10)
1	7.22%	2.50%	4.72%	2.25%	6.97%	0.51%	0.41%	6.87%		13.67%
2	7.32%	2.20%	5.12%	2.25%	7.37%	0.51%	0.41%	7.27%		12.36%
3	7.65%	2.25%	5.40%	2.25%	7.65%	0.51%	0.41%	7.55%		13.59%
4	7.83%	2.26%	5.57%	2.25%	7.82%	0.51%	0.41%	7.72%		12.51%
5	7.61%	2.00%	5.61%	2.25%	7.86%	0.51%	0.41%	7.76%		13.31%
6	7.19%	1.56%	5.63%	2.25%	7.88%	0.51%	0.41%	7.78%		12.24%
7	8.50%	2.20%	6.30%	2.25%	8.55%	0.51%	0.41%	8.45%		13.88%
8	8.77%	2.25%	6.52%	2.25%	8.77%	0.51%	0.41%	8.67%		16.57%
Average	**7.76%**	**2.15%**	**5.61%**	**2.25%**	**7.86%**	**0.51%**	**0.41%**	**7.76%**		**13.52%**
Average of Middle 6	**7.68%**	**2.08%**	**5.60%**	**2.25%**	**7.85%**	**0.51%**	**0.41%**	**7.75%**		**12.98%**

Conclusion:

To repeat, the most appropriate net investment return assumption to use for the LLA actuary's 2016 TRSL actuarial valuation is 7.0%.

OPINIONS OF OTHER PUBLIC SECTOR PROFESSIONALS

Many retirement systems have been lowering their investment return assumptions in recent years. Consider the following table from the National Association of State Retirement Administrators (NASRA).



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 2016 actuarial valuation of TRSL. It is not useful for actually informing assumption-setters 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.

4. *Discount rate vs. investment return*. Comparing the current 8.10% to the universe of other state retirement systems yields a very different view than comparing 7.75%. Again, the net investment return assumption for TRSL is 8.10%, not 7.75%.

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). This is a reasonable estimate for the current year. However, this approach slightly overstates the cost of administrative expenses in future years because the plan assets are expected to grow faster than the administrative expenses.

Furthermore, this approach violates the GASB's requirements for financial reporting.

A more transparent and consistent approach for recognizing the cost of administrative expenses required to deliver plan benefits is to add a load onto the normal cost equal to an estimate percentage of covered payroll, which is a better reference base than plan assets. For the last seven years, the actual administrative expenses have remained between 0.44% and 0.47% of covered payroll. Therefore, the LLA's actuary has used a normal cost load of 0.46% to fund expected administrative expense outflows.

Refer to the table on the following page for a history of administrative expenses, both as a percent of assets (as for the current TRSL approach) and as a percent of covered payroll (as for the LLA actuary's valuation report). Notice the greater stability in administrative expense when expressed as a percent of covered payroll as compared to a percent of assets.

The LLA's actuary believes this more transparent and consistent approach does not violate the statutes. The language in R.S. 11.102(B)(3) does not prohibit a minor load on the normal cost to account for the administrative cost of delivering the benefits. This load on normal cost is common and generally accepted as not violating an otherwise-required entry age normal cost calculation for benefits.

Act 94 of 2016 requires that the projected noninvestment-related administrative expenses for the contributions 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.

The LLA's actuary believes this more transparent and consistent approach should, and may be, implemented under the current statutory framework.

Appendix D: Basis for Treatment of Administrative Expenses

Administrative Expenses (for Year Ending June 30)	2010	2011	2012	2013	2014*	2015*	2016*	5-Year Average
General Administrative Expenses	16,154,823	15,417,596	16,317,659	15,750,180	15,026,969	14,259,428	14,532,681	
Miscellaneous and Employee Pensions, Health & Life Expense	1,813,334	1,477,395	1,050,097	974,145	1,047,832	3,764,366	2,492,633	
Depreciation Expense	543,096	537,060	440,291	377,150	322,881	384,426	407,105	
Total Administrative Expenses	18,511,253	17,432,051	17,808,047	17,101,475	16,397,682	18,408,220	17,432,419	
As a Percent of Expected Covered Payroll	0.47%	0.45%	0.47%	0.46%	0.44%	0.48%	0.45%	0.46%
As a Percent of Beginning Market Value	0.16%	0.15%	0.12%	0.12%	0.11%	0.10%	0.10%	0.11%
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	
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	

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

The following includes some repetition of the material presented in the Summary and Conclusions section of this report. However, it bears repeating.

Currently, TRSL recognizes the cost of gain-sharing/cost-of-living adjustments (COLAs) by reducing the net investment return assumption by 25 basis points (0.25% of plan assets). This is an implicit and non-transparent method for pre-funding the costs.

A more explicit and transparent method estimates (through stochastic modelling techniques) what would be a single *equivalent* annual COLA increase, and measures that in the actuarial valuation. While the actuarial standards of practice allow for the measurement of the gain-sharing/COLAs in this implicit fashion, in the opinion of the LLA's actuary, the current implicit approach has several deficiencies in operation which are rectified by this more explicit and transparent approach, even if the end-result is not substantially different.

It is important to note that an assumption or a method may not specifically violate an actuarial standard of practice; but such an assumption or method may nevertheless be unacceptable or have numerous deficiencies. For example, adding 10 plus 10 to obtain 22 does not violate any specific actuarial standard of practice; but is clearly unacceptable.

In addition, in actuarial practice, sometimes it can be observed that two approaches reach approximately the same costs and liabilities; but that observation does not make both approaches equally valid. For example, actuaries do not use life expectancies in their valuation calculations, but use mortality tables' full range of probabilities of death at each age through age 120. For certain calculations, these two approaches might not result in substantially different answers; but no self-respecting actuary uses life expectancies to prepare actuarial valuations.

Following is a list of operational and compliance deficiencies of the current implicit approach to measuring TRSL's gain-sharing/COLA benefits which make a more explicit approach preferable and which led the LLA's actuary to select the explicit approach for this actuarial valuation report.

1. The current implicit approach obscures the true underlying net return assumption. For transparency and comparability to other systems, the 8.10% is the true net investment return assumption. However, because the 7.75% is the rate that is publicly disclosed, it is understood by users of financial statements and the public in general to be the net investment return assumption when it is not. A more transparent approach would be for the net return assumption to be the same as the discount rate.

2. The current implicit approach is specifically prohibited by the GASB for Statement No. 68 purposes for the June 30, 2016 measurement date (2017 employer reporting year) and specifically prohibited for GASB No. 67 purposes for the June 30, 2017 plan's reporting year. Therefore, a move to an explicit approach for funding would keep the two valuations (funding and accounting) consistent with each other.

   As mentioned previously, the current implicit approach for measuring the cost of administrative expenses is also specifically prohibited by the GASB.

3. The current implicit approach creates confusion and double-counting when applying the statutory template mechanism for determining the amount of an experience account transfer. Making 7.75% the hurdle for experience account transfers is a form of double-counting. It is already is reduced by 0.25% for COLA (and by 0.10% for administrative expenses), which makes it easier for experience account transfers to occur by measuring returns against a lower bar and is not entirely consistent with the statutory language for calculating experience account transfers.

4. The current implicit approach inhibits the measurement of the effect of legislative bills that may alter the triggers, hurdles and other formulas in the statutory template that determine (a) whether and how much is transferred to the experience account, (b) whether and when a permanent benefit increases may be granted and (c) who is eligible for such a permanent benefit increase. The explicit approach provides the actuary with a better understanding of the inner workings and interactions of all the moving parts of the gain-sharing program. The explicit approach allows for easier measurement of the effect of such legislative proposals.

5. The current implicit approach gives no useful information concerning how much the current complex gain-sharing structure is expected to provide in terms of a fixed annual or biennial COLA increase. The explicit approach does so naturally.

6. The current implicit approach is much more difficult and even contradictory to isolate the actuarial gain or loss arising due investment earnings separate from experience account transfer occurring or not.

7. The explicit approach is more consistent with modern financial engineering methodologies and the growing actuarial momentum for measuring complex benefit provisions in pension plans. This implicit approach is fast becoming considered an old-fashioned/quick-and-dirty/rough approach, supplanted by more explicit approaches.

8. In order to estimate the amount (in basis points) by which to reduce the investment return assumption to account for gain-sharing/COLAs, a full stochastic model should be built and run anyway. Without building a full model for TRSL's complex gain-sharing structure, it is just guessing (or using a flawed historical analysis). So as long as the full model needs to be built and run, the LLA's actuary chose to use the output in an explicit form.

By modelling the statutory template mechanism using the economic assumptions from eight major national investment forecasters (the same basis for developing the 7.00% net return assumption for valuation purposes), the LLA's actuary and GRS determined that a 0.50% annual COLA benefit approximates the 50th percentile expectation of future experience account transfers over the next 30 years.

Therefore, the final determination of the contribution requirements for the 2018 year presented herein were developed using an annual net return assumption (and discount rate) of 7.00% and an single equivalent COLA increase of 0.50% per year.

The explicit approach.

The explicit approach projects the expected streams of future gain-sharing transfers into the experience account using the investment-related assumptions adopted by the LLA's actuary. The explicit model stochastically generated net investment returns for the next 30 years, and does 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 7.76% and standard deviation of 13.52% to simulate the operation of TRSL's complex gain-sharing/COLA program. That 7.76% mean is the 1-year expected return and equals the average (consensus) of the eight major national investment forecasters in the GRS Survey. The same is true for the source of the 13.52% standard deviation.

The model applied the various internal statutory limitations and restrictions 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:

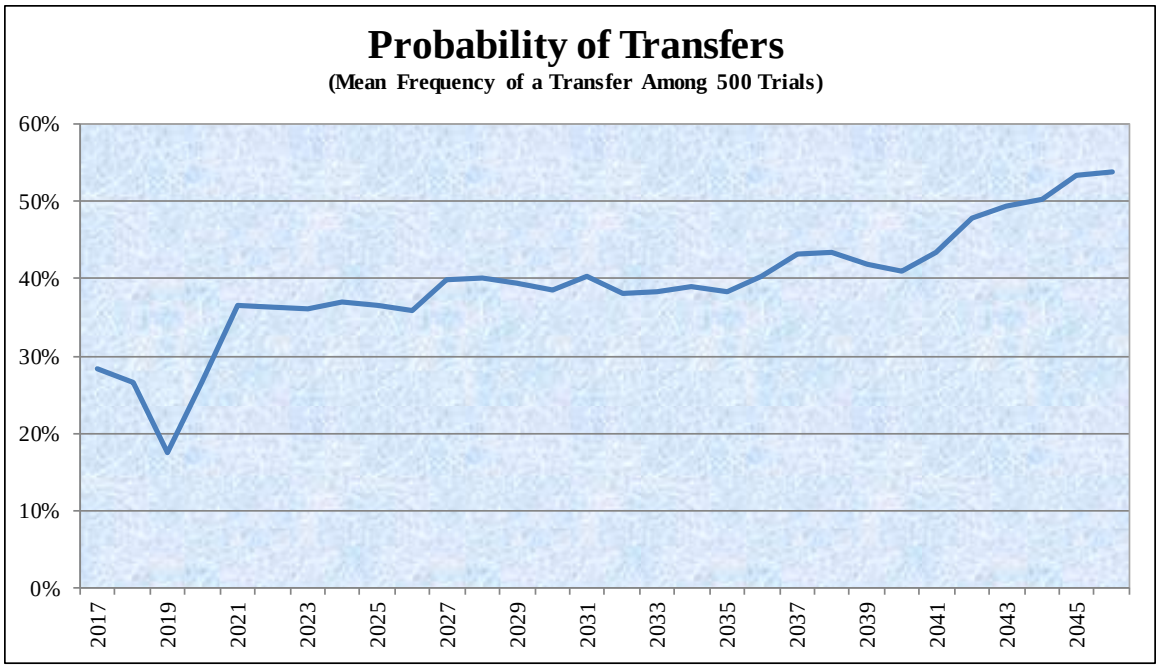
1. Modelling future new hires and future actuarial valuations,
2. Modelling the markets and future rates of return using generally acceptable techniques,
3. Modelling the actuarial rate of return,
4. Modelling the dollar hurdle,
5. Modelling the limitations on the experience account,
6. Modelling the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

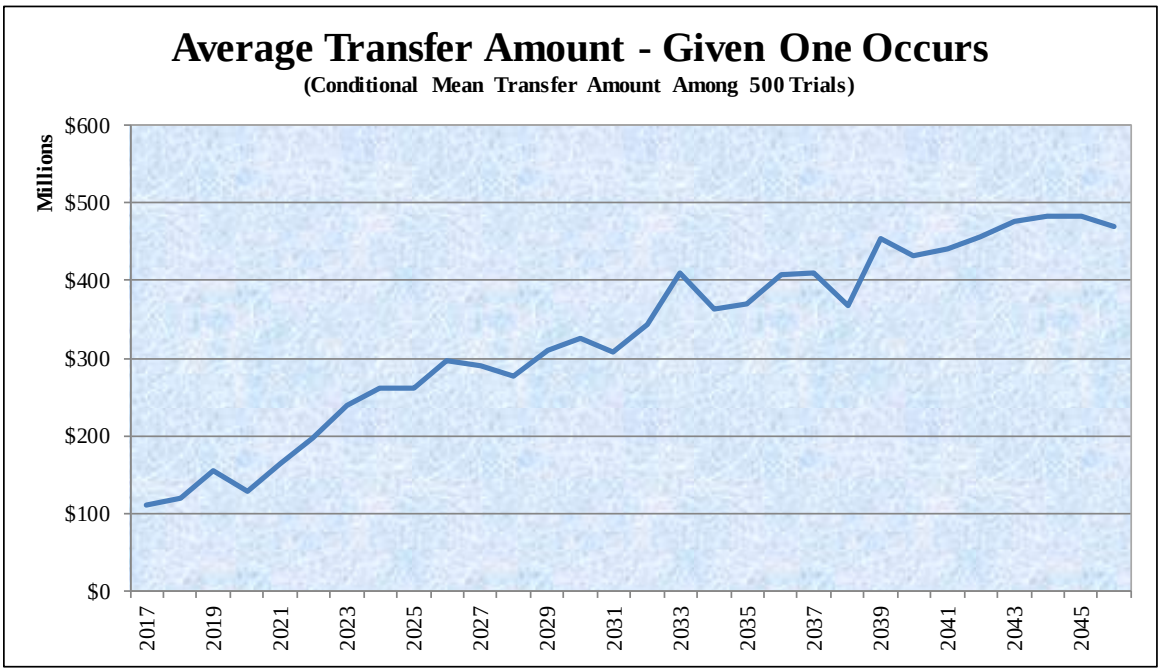
In some years, the model expects a transfer to the experience account and in some years expects none. For each year in which the model expects a transfer, the amount can vary widely.

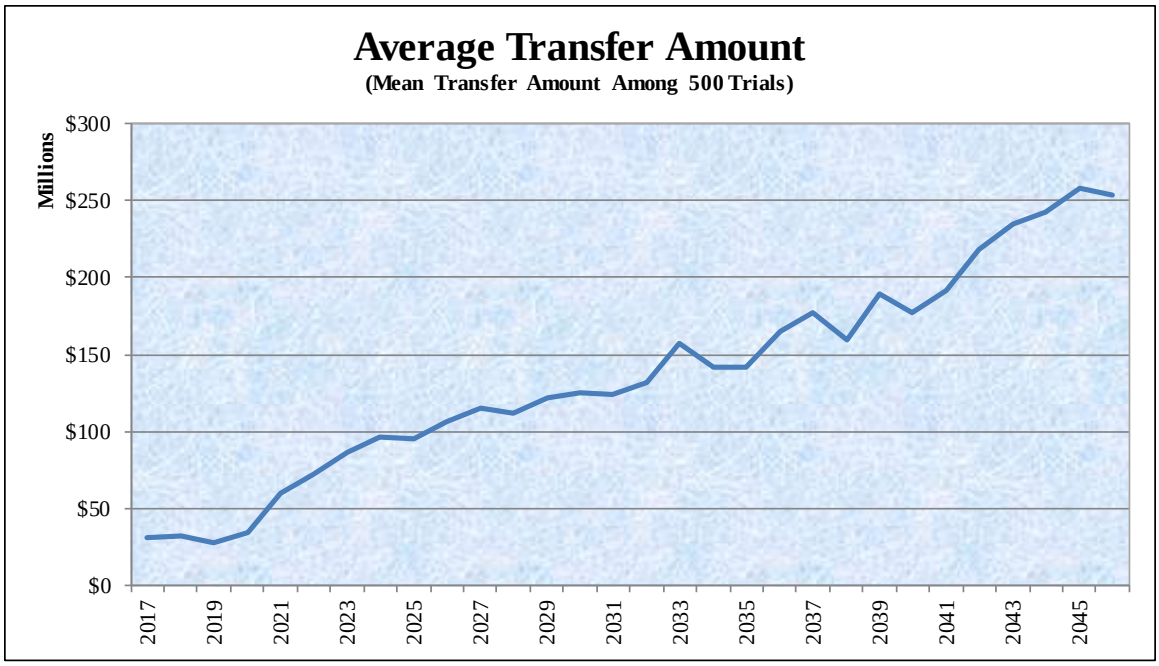
The mean (average) amount expected to be transferred to the experience account each year was captured and their present value calculated. It was determined that a 0.50% annual cost-of-living increase (COLA) would produce the same additional present value. It is, therefore, considered the single equivalent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

Thus, the *explicit approach* is more appropriate for the eight reasons cited above.

Consider the following graphs illustrating the results (experience account transfers) of the Monte Carlo simulations in the stochastic model of TRSL's gain-sharing/COLA program.


Probability of Transfers
(Mean Frequency of a Transfer Among 500 Trials)
60%
50%
40%
30%
20%
10%
0%
2017
2019
2021
2023
2025
2027
2029
2031
2033
2035
2037
2039
2041
2043
2045


Average Transfer Amount - Given One Occurs
(Conditional Mean Transfer Amount Among 500 Trials)
Millions
$600
$500
$400
$300
$200
$100
$0
2017
2019
2021
2023
2025
2027
2029
2031
2033
2035
2037
2039
2041
2043
2045


Average Transfer Amount
(Mean Transfer Amount Among 500 Trials)
Millions
$300
$250
$200
$150
$100
$50
$0
2017
2019
2021
2023
2025
2027
2029
2031
2033
2035
2037
2039
2041
2043
2045