2016 ACTUARIAL VALUATION REPORT ON THE LOUISIANA STATE EMPLOYEES' RETIREMENT SYSTEM

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

LOUISIANA LEGISLATIVE AUDITOR
1600 NORTH THIRD STREET
POST OFFICE BOX 94397
BATON ROUGE, LOUISIANA 70804-9397

LEGISLATIVE RETIREMENT COMMITTEE CHAIRMEN
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ASSISTANT LEGISLATIVE AUDITOR FOR STATE AUDIT SERVICES
NICOLE EDMONSON, MPA, CIA, CGAP, CRMA

MANAGER OF ACTUARIAL SERVICES
PAUL T. RICHMOND, ASA, MAAA, EA

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2016 ACTUARIAL VALUATION REPORT

LOUISIANA STATE EMPLOYEES' RETIREMENT SYSTEM

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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 Louisiana State Employees' Retirement System as of June 30, 2016, by the actuary for 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

LASERS 2015 VALUATION

SUMMARY AND CONCLUSIONS

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2016 Actuarial Report on the Louisiana State Employees' Retirement System

This valuation has been prepared as of June 30, 2016, based on plan provisions for the Louisiana State Employees' Retirement System (LASERS) as documented in Title 11 of Louisiana Revised Statutes (R.S.), Sections 401 through 621. 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 of the 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 the 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 LASERS 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 LASERS 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 economic assumptions and methods used by the LASERS' actuary:

    a. Mortality Tables,

    b. Investment Return assumption, Inflation and Discount Rate assumptions

    c. Treatment of Administrative Expenses,

    d. Treatment of Gain-Sharing COLA benefits.

    Therefore, the LLA's actuary is required by Actuarial Standards of Practice (ASOPs) to use an assumption set that he can support, endorse or 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 LASERS' own mortality experience.

The most recent experience study covered the period from July 1, 2008 through June 30, 2013 and was dated January 16, 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 LASERS' active and retiree population directly into the mortality tables, as was done by LASERS' actuary in developing the turnover tables.

This is accomplished by multiplying each entry in a set of published reference tables by LASERS-derived mortality experience factors. The LASERS experience study report presented results broken out by males and females, but combined active employees and retirees (and beneficiaries).

Therefore, there are two LASERS-derived experience factors applied to each of the respective reference tables.

This method of applying LASERS-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 scales 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 the RPEC. The most recently published mortality improvement scale is called MP-2016.

The LLA's actuary recognizes the experience studies for larger systems are generally performed every five years and the next one for LASERS is not scheduled until 2018 or 2019. 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 LASERS-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

The discount rate for LASERS is 7.75% (before the reduction to 7.70% for determining the employer contribution rate for FYE 2018). LASERS' actuarial valuation report (prepared by Foster

and Foster) states that the discount rate is already net of investment expenses, net of administrative expenses (15 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 8.15%. By adding the 15 basis points and the 25 basis points back on top of the 7.75% discount rate, the LASERS' investment return assumption can be derived to be 8.15%.

The 8.15% is the net return (after investment-related expense) that LASERS assumes it will earn on its portfolio. As stated in the Foster and Foster valuation report, if the 15 basis points and the 25 basis points are subtracted from the 8.15%, 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 7.25% (without any further reductions for administrative expenses and experience account transfers). For more details on how the 7.25% was determined and its prudence, refer to Appendix C.

The LASERS report states that the inflation rate assumption is 3.00%. As part of the building block approach to developing the 7.25% stated above, the LLA's actuary assumes the most appropriate choice of the inflation rate is 2.25%. The same method was used for inflation as it pertains to 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 requirement for FYE 2018. No further reductions to the 7.25% 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 this 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 LASERS' investment portfolio to earn substantially less over the next 10-20 years than the 8.15% 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**	**LASERS' Actuary**
Real Rate of Return on Investments	5.00%	5.15%
Rate of Inflation	2.25%	3.00%
Total Rate of Return on Investments	7.25%	8.15%
Rate of Return Diverted to Pay for Administrative Expenses	0.00%	0.15%
Rate of Return Diverted to Pay for the Gain Sharing/COLA Program	0.00%	0.25%
Discount Rate	7.25%	7.75%

Treatment of Administrative Expenses

Currently, LASERS recognizes the cost of paying administrative expenses required to deliver plan benefits by reducing the net investment return assumption by 15 basis points (i.e., 0.15% 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. For example, seven years ago, actual administrative expenses were approximately 0.25% of plan assets; but as plan assets have grown, administrative expenses have not grown as fast. The ratio is currently about 0.15%. 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 averaged 0.92% of covered payroll. Therefore, the LLA's actuary has used a normal cost load of 0.92% 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 administrative cost of delivering the benefits.

For more details on how the 0.92% was determined and the rationale for this more-transparent and consistent approach, refer to Appendix D.

Treatment of Gain-Sharing COLA Benefits

Currently, LASERS 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 cost of the system's COLA benefit provisions.

A more explicit and transparent method would be to estimate (through stochastic modeling techniques) a single and *equivalent* 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 8.15% 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 COLA (and by 0.15% 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. The 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 LASERS' complex gain-sharing structure, it is just guessing (or using a flawed historical analysis). Building a full model for LASERS's complex gain sharing structure allows the LLA actuary to put greater emphasis on forward looking analysis. The current LASERS 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 7.25% net return assumption for valuation purposes), the LLA's actuary, and GRS determined that a 0.4% 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 0.40% 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 7.25% and a single equivalent COLA increase of 0.40% per year.

For more details on how the 0.40% 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 LASERS' 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 LASERS' 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, LASERS proposed to change the discount rate from 7.75% to 7.70% (and the net return assumption from 8.15% to 8.10%) 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 8.10% 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 6/30/18 (as Pct of Projected Covered Pay)
(1) Without Any Changes in Assumptions or Methods *(benchmark values)*	6,862.7	37.4%
(2) Change in Mortality Table *(effect of change in Mortality table against benchmark)*	6,852.2	37.5%
a. Effect of the Change: (2)-(1)	(10.5)	0.1%
(3) New Investment Return Assumption *(effect of changes to the Mortality Table and Investment Rate Assumption against benchmark)*	8,277.0	43.4%
a. Effect of this Additional Change: (3)-(2)	1,424.8	5.9%
(4) New Treatment of Administrative Expense *(effect of changes to the Mortality Table, Investment Rate Assumption, and New Treatment of Administrative Expenses against benchmark)*	8,012.3	43.1%
a. Effect of this Additional Change: (4)-(3)	(264.7)	-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)*	8,134.1	43.7%
a. Effect of this Additional Change: (5)-(4)	121.8	0.6%
b. Effect of All four Changes: 2a+3a+4a+5a = (5)-(1)	1,271.4	6.3%

(2) Change in mortality tables from RP-2000 with *static* mortality improvement Scale AA to 2015 to applying LASERS-derived experience factors to RP-2014 with *generational* mortality improvement scale MP-2016

(3) Change in net investment return assumption from LASERS' 8.15% (not to be confused with LASERS' 7.75% discount rate) to LLA's 7.25% net investment return assumption

(4) Change in administrative expenses from LASERS' implicit reduction of net return assumption (down by 0.15%) to LLA's explicit normal cost load (of 0.92% of covered payroll)

(5) Change in gain-sharing COLA increases from LASERS' implicit reduction of net return assumption (down by 0.25%) to LLA's explicit single equivalent annual 0.40% 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. LASERS.
Other User	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	48,201	47,643	46,940
	(2) Actives	39,284	40,194	40,321
	(3) DROP	1,609	1,682	1,838
	(4) Terminated Vested	3,865	3,953	4,558
B.	**Annual Benefits**	$ 1,217,858,640	$ 1,170,269,160	$ 1,074,358,980
C.	**Total Payroll**	1,842,286,184	1,856,735,292	1,813,759,357
D.	**Valuation Assets**	11,630,816,397	11,318,433,015	10,606,474,675
E.	**Experience Account**	9,714,942	123,579,684	117,093,356
F.	**Investment Returns**			
	(1) Market (Total Assets)	-2.64%	1.34%	17.55%
	(2) Market (excl. OPR & self-directed)	-2.86%	1.30%	18.19%
	(3) Net Actuarial Value	5.43%	10.64%	13.45%
	(4) Rate for DROP Accounts	4.93%	10.14%	12.95%
G.	**Normal Costs**			
	(1) Total in Dollars	$ 219,475,742	$ 222,225,784	$ 208,898,813
	(2) Total Normal Cost Rate	11.91%	11.97%	11.52%
	(3) Employer Normal Cost Rate	3.93%	4.00%	3.56%
H.	**Accrued Liability**	$ 18,576,266,623	$18,216,660,456	$ 17,877,744,945
I.	**Unfunded Accrued Liability**	$ 6,945,450,226	$ 6,898,227,441	$ 7,271,270,270
J.	**Funded Percentage**	62.6%	62.1%	59.3%
K.	**Funding Requirements for the Fiscal Year Following the Valuation Date**			
	(1) Employees			
	a) Contributions	$ 149,441,831	$ 15,095,128	$ 146,448,588
	b) Rate	7.980%	7.970%	7.953%
	(2) Employers			
	a) Contributions	$ 700,057,185	$ 691,947,107	$ 693,094,712
	b) Rate	37.38%	36.74%	37.64%
L.	**Funding Requirements for the Subsequent Fiscal Year**			
	(1) Employees			
	a) Contributions	$ 152,741,091	$ 153,340,984	$ 149,866,717
	b) Rate	7.980%	7.970%	7.953%
	(2) Employers			
	a) Contributions	$ 835,979,181	$ 735,610,376	$ 697,562,314
	b) Rate	43.68%	38.23%	37.02%

Contribution Rates for FYE 2018

Contribution requirements for LASERS for FYE 2018 vary from sub plan to sub plan. And, the total contribution rate for each sub plan has 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 all sub plans
5. UAL Costs specific to a particular sub plan

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

Projected Contribution Rates for FYE 2018							
						Plan	Total
		Total	Employee	Employer	Shared	Specific	Employer
	Status	NC	NC	NC	UAL	UAL	Cost
				(C) =			(F) =
Sub Plan	7/1/2016	(A)	(B)	(A) - (B)	(D)	(E)	(C) + (D) + (E)
Rank & File and Appellate Law Clerks	O	13.07%	7.70%	5.37%	38.19%	0.06%	43.62%
Pre 2011 Judges & Court Offs	C	18.74%	11.50%	7.24%	38.19%	0.00%	45.43%
Post 2011 Judges	O	20.24%	13.00%	7.24%	38.19%	0.00%	45.43%
Legislators	C	25.05%	11.50%	13.55%	38.19%	0.01%	51.75%
Corrections Officers Primary	C	10.28%	9.00%	1.28%	38.19%	0.00%	39.47%
Corrections Offs Secondary	C	14.19%	9.00%	5.19%	38.19%	0.00%	43.38%
Wildlife Officers	C	24.11%	9.50%	14.61%	38.19%	0.00%	52.80%
Peace Officers	C	12.96%	9.00%	3.96%	38.19%	0.00%	42.15%
ATC Officers	C	14.87%	9.00%	5.87%	38.19%	0.00%	44.06%
Bridge Police Officers	C	11.69%	8.40%	3.29%	38.19%	0.00%	41.48%
Harbor Police	C	14.74%	9.00%	5.74%	0.00%	6.39%	12.13%
Hazardous Duty Officers	O	15.26%	9.50%	5.76%	38.19%	0.12%	44.07%
Total		7.98%	7.98%	0.00%	38.19%	5.49%	43.68%

Status

O – Plan is open to new members.
C – Plan is closed to new members.

LASERS receives a direct payment from three special funds. The amount of normal cost and amortization cost received from each fund is summarized below:

Payments From Special Funds for FYE 2018			
Special Fund	**Normal Cost**	**Amortization Cost**	**Total Payment**
Adult Probation and Parole Officers	50,450	578,799	629,249
Peace Officers	0	294,421	294,421
ATC Officers	0	80,798	80,798
Harbor Police	0	687,007	687,007
Total	50,450	1,641,025	1,691,475

Funding Requirements Specific to Individual Sub Plans

Although most funding components are shared, some components apply only to an individual sub plan or to a group of employees within a sub plan. These situations are summarized below.

Rank & File − The disability accrual rate for members hired on or after July 1, 2006, was increased by Act 262 of the 2008 regular session of the legislature. Retirement eligibility for members hired on or after July 1, 2006, was changed by Act 992 of the 2010 session. The unfunded accrued liability associated with the Rank & File sub plan increased as a result of this legislation. The increase in UAL is being amortized with level payments over a 30-year period. UAL payments pertaining to these benefit changes are being charged only to employers of Rank & File employees.

Hazardous Duty Officers – The normal form of benefit for members of LASERS who elect to join the hazardous duty plan was changed by Act 992 of the 2010 session. The resultant UAL is being amortized with level payments over a period of 10 years. Employers of hazardous duty personnel are responsible for this amortization payment.

Alcohol Tobacco Control Officers – Eligibility requirements for enforcement officers of Alcohol Tobacco Control were modified by Act 740 of the 2008 session. The resultant UAL is being amortized with level payments over a 10-year period. This amount is being paid from the Department of Revenue Alcohol and Tobacco Control Officers Fund.

Peace Officers – The benefit accrual rate for certain Peace Officers was increased by Act 414 of the 2007 session. The UAL created by this change is funded with level annual payments over 30 years. The UAL contribution is paid from the Department of Public Safety Peace Officers Fund.

Adult Probation and Parole – The benefit accrual rate for certain members of the Corrections Primary sub plan was increased by Act 852 of the 2014 session. The increase in the UAL and the increase in the normal cost associated with the benefit increase are funded by appropriations from the Adult Probation and Parole Officer Retirement Fund (APPOR Fund). The first payment of $1,000,000 was made from the APPOR Fund on March 30, 2015. First year accounting relative to LASERS and the APPOR Fund is shown below.

A. Normal Cost		
1. Mid-Year Normal Cost Associated with Act 852	$	57,980
2. Interest Adjustment from January 1, 2016 to June 30, 2016		2,205
3. Normal Cost on June 30, 2016	$	60,185
B. UAL Amortization		
1. UAL Associated with Act 852 on July 1, 2015	$	5,278,524
2. Interest Adjustment from July 1, 2015 to June 30, 2016		409,086
3. UAL Associated with Act 852 on June 30, 2016	$	5,687,610

C. Payments by the APPOR Fund to LASERS		
1. Payment on March 30, 2016	$	1,000,000
2. Interest Adjustment from March 30, 2016 to June 30, 2016		18,836
3. Accumulated Payments on June 30, 2016	$	1,018,836
D. Adjustment to the Act 852 UAL on June 30, 2016		
1. Normal Cost	$	60,185
2. UAL Amortization Cost		5,687,610
3. Total Cost	$	5,747,795
4. Accumulated Payments		1,018,836
5. UAL Balance on June 30, 2016 = D3 – D4	$	4,728,959
E. UAL Amortization Payment (Level Payments over 9 Years)	$	721,309

The mid-year normal cost payment and mid-year amortization payment due from the APPOR Fund for FYE 2017 are $53,563 and $721,309 respectively. The mid-year normal cost payment and mid-year amortization payment due from the APPOR Fund for FYE 2018 are $49,201 and $721,309 respectively.

Harbor Police – Act 648 of the 2014 session provided for the development of a Cooperative Endeavor Agreement (CEA) between LASERS and the Harbor Police Retirement System (HPRS), which would identify the terms of a merger between the two systems. The CEA provides the following:

1. LASERS will create a new sub plan for members of HPRS on June 30, 2014.

2. Any person employed by the Port of New Orleans on or after July 1, 2014, who otherwise would have joined HPRS, will become a member of the LASERS Hazardous Duty sub plan.

3. A member of the Harbor Police sub plan may elect to transfer to the Hazardous Duty sub plan of LASERS and relinquish his benefit rights under the old HPRS plan.

4. The total contribution rate applicable to the Hazardous Duty sub plan will apply to police officers of the Port of New Orleans.

5. The employer contribution rate for the Harbor Police sub plan will be equal to the employer normal cost for the sub plan. The port of New Orleans will not pay either a shared amortization cost or a specific amortization cost on behalf of members of the Harbor Police sub plan through FYE 2022.

6. The Port of New Orleans agrees to pay on or before June 30, 2022, the unfunded accrued liability of the HPRS as measured on July 1, 2015. This is considered to be a LASERS asset.

Sources and Amounts of Gains and Losses for FYE 2016

Gains and losses 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**			**$ 6,898,227,442**
B.	**Increases in the UAL Due to:**			
	1. Interest on the UAL	$ 534,612,627		
	2. Permanent Benefit Increase	120,572,581		
	3. Employer Contribution Shortfall	0		
	4. Assumption Change (Discount Rate)	0		
	5. Investment Loss	249,797,074		
	6. Experience Loss	0		
	7. Harbor Police	3,358,474		
	8. Total Increases = B1 + B2 + B3 + B4 + B5 + B6 + B7			**$ 908,340,756**
C.	**Decreases in the UAL Due to:**			
	1. Employer Amortization Payment	$ 644,434,960		
	2. Disbursement from the Experience Account	120,572,581		
	3. Employer Contribution Surplus	15,271,071		
	4. Investment Gain	0		
	5. Experience Gain	80,839,360		
	6. Total Decreases = C1 + C2 + C3 + C4 + C5			**$ 861,117,972**
D.	**Unfunded Accrued Liability on June 30, 2016** = A + B8 - C6			**$ 6,945,450,226**

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. 11:102C requires separate calculations of normal cost for each sub plan within LASERS, 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 Net of Act 852	$ 73,600,833	3.930224%
B.	Act 852 Normal Cost	53,563	n/a
C.	Shared Amortization Payments	570,101,102	30.442930%
D.	Amortization Payments for Sub Plans	2,947,794	0.157410%
E.	Contribution Variance Payments	55,209,449	2.948139%
F.	Total Contribution = A + B + C + D + E	$ 701,912,741	37.481564%
G.	Act 414 Appropriation (Peace Officers Fund)	305,122	0.016293%
H.	Act 740 Appropriation (ATC Officers Fund)	80,986	0.004325%
I.	Harbor Police Amortization Appropriation	694,576	0.037090%
J.	Act 852 AP&P Amortization Appropriation	721,309	0.038517%
K.	Act 852 AP&P Normal Cost Appropriation	53,563	n/a
L.	Net Required Contribution = F - G - H - I - J - K	$ 700,057,185	37.382478%
M.	Projected Payroll for FYE 2017	$ 1,872,687,991	
N.	Total Contribution Rate for FYE 2017 = L / M	37.38%	
O.	Minimum Contribution Rate	15.50%	
P.	Minimum Required Contribution for FYE 2017 = M x O	$ 290,266,639	15.500000%
Q.	Required Employer Contribution for FYE 2017 = The Greater of L and P	$ 700,057,185	37.382478%

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. 11:102C requires separate calculations of normal cost for each sub plan within LASERS, 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 Net of Act 852	$ 104,308,834	5.449692%
B.	Act 852 Normal Cost	50,450	n/a
C.	Shared Amortization Payments	680,332,285	35.544462%
D.	Amortization Payments for Sub Plans	2,779,925	0.145239%
E.	Contribution Variance Payments	50,199,162	2.622692%
F.	Total Contribution = A + B + C + D + E	$ 837,670,656	43.764721%
G.	Act 414 Appropriation (Peace Officers Fund)	294,421	0.015382%
H.	Act 740 Appropriation (ATC Officers Fund)	80,798	0.004221%
I.	Harbor Police Amortization Appropriation	687,007	0.035893%
J.	Act 852 AP&P Amortization Appropriation	578,799	0.030240%
K.	Act 852 AP&P Normal Cost Appropriation	50,450	n/a
L.	Net Required Contribution = F - G - H - I - J - K	$ 835,979,181	43.676349%
M.	Projected Payroll for FYE 2018	$ 1,914,031,733	
N.	Total Contribution Rate for FYE 2018 = L / M	43.68%	
O.	Minimum Contribution Rate	15.50%	
P.	Minimum Required Contribution for FYE 2018 = M x O	$ 296,674,919	15.500000%
Q.	Required Employer Contribution for FYE 2018 = The Greater of L and P	$ 835,979,181	43.676349%

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 FYE 2017.

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 7.25% discount rate 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	$ 145,746,775	$ 151,821,992	$ 148,042,083	$ 160,662,223
2. Disability Benefits	4,723,807	5,378,880	4,892,162	5,033,785
3. Survivor Benefits	4,984,501	6,432,278	4,980,945	5,356,341
4. Voluntary Terminations	64,020,659	66,888,215	64,310,594	65,925,935
5. Total Normal Cost	$ 219,475,742	$ 230,521,365	$ 222,225,784	$ 236,978,284
6. Act 852 Normal Cost	53,563	55,721	58,331	62,203
7. Load for Administrative Expenses	N/A	16,949,033	N/A	N/A
8. Total Normal Cost Net of Act 852 = A5 - A6 + A7	$ 219,422,179	$ 247,414,677	$ 222,167,453	$ 236,916,081
B. Payroll				
1. On Valuation Date	$1,842,286,184	$1,842,286,184	$1,856,735,292	$1,856,735,292
2. Projected for FY after Valuation Date	1,872,687,991	n/a	1,883,236,638	n/a
3. Projected for 2nd FY after Valuation Date	n/a	1,914,031,733	n/a	1,923,962,135
C. Normal Cost Rates				
1. Total Normal Cost Rate = A8 / B1	11.910320%	13.429763%	11.965488%	12.759820%
2. Employee Normal Cost Rate	7.980071%	7.980071%	7.970062%	7.970062%
3. Employer Normal Cost Rate = C1 – C2	3.930249%	5.449692%	3.995426%	4.789758%

D.	**Employer Normal Cost in Dollars Net of Act 852**							
	1. For 1st FY after Valuation Date = B2 x C3	$ 73,601,301		n/a	$ 75,243,326		n/a	
	2. For 2nd FY after Valuation Date = B3 x C3		n/a	$ 104,308,834		n/a	$ 92,153,130	
E.	**Employee Normal Cost**							
	1. For 1st FY after Valuation Date = B2 x C2	$ 149,441,831		n/a	$ 150,095,128		n/a	
	2. For 2nd FY after Valuation Date = B3 x C2		n/a	$ 152,741,091		n/a	$ 153,340,975	
F.	**Total Normal Cost**							
	1. For FYE 2017 = D1 + E1	$ 223,043,132		n/a	$ 225,338,454		n/a	
	2. For FYE 2018 = D2 + E2		n/a	$ 257,049,925		n/a	$ 245,494,105	

Increases in Normal Cost Attributable to Assumption Change

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 7.25% 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	New Assumptions	Increase/ (Decrease)
A.	**Total Normal Cost**			
	1. Retirement Benefits	$ 145,746,775	$ 151,821,992	$ 6,075,217
	2. Disability Benefits	4,723,807	5,378,880	655,073
	3. Survivor benefits	4,984,501	6,432,278	1,447,777
	4. Voluntary Terminations	64,020,659	66,888,215	2,867,556
	5. Total Normal Cost	$ 219,475,742	$ 230,521,365	$ 11,045,623
	6. Act 852 Normal Cost	(53,563)	(55,721)	(2,158)
	7. Load for Administrative Expenses	N/A	16,949,033	N/A
	8. Total Normal Cost Net of Act 852	$ 219,422,179	$ 247,414,677	$ 27,992,498
B.	**Payrolls**			
	1. Projected Payroll on June 30, 2016	$ 1,842,286,184	$ 1,842,286,184	$ -
	2. Projected Payroll for FYE 2017	1,872,687,991	1,872,687,991	-
	3. Projected Payroll for FYE 2018	1,914,031,733	1,914,031,733	-
C.	**Normal Cost Rates**			
	1. Total Normal Cost Rate Net of Act 852 = A7/B1	11.910320%	13.429763%	1.519443%
	2. Employee Normal Cost Rate	7.980071%	7.980071%	0.000000%
	3. Employer Normal Cost Rate Net of Act 852 = C1 - C2	3.930249%	5.449692%	1.519443%
D.	**Employer Normal Costs Net of Act 852**			
	1. Projected Cost for FYE 2017 = B2 x C3	73,601,301	102,055,728	28,454,427
	2. Projected Cost for FYE 2018 = B3 x C3	75,226,213	104,308,834	29,082,621
E.	**Employee Normal Costs**			
	1. Projected Cost for FYE 2017 = B2 x C2	149,441,831	149,441,831	-
	2. Projected Cost for FYE 2018 = B3 x C2	152,741,091	152,741,091	-

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 (8.15%) 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	4,747,738,482	4,757,741,824
	(b) Disability Benefits	68,781,779	67,414,732
	(c) Survivor Benefits	68,073,116	64,156,256
	(d) Voluntary Terminations	-	-
	(e) Total	$ 4,884,593,377	$ 4,889,312,812
	(f) Ratio of Active Liability to Total Accrued Liability	26.29%	26.84%
2	**Accrued Liability for Retired and Inactive Members**		
	(a) Regular Retirees	10,039,272,375	9,650,771,799
	(b) Disability Retirees	281,289,586	282,699,394
	(c) Survivors	737,348,595	722,670,033
	(d) Members with a Deferred Benefit	333,434,315	337,838,121
	(e) Contributions to be Refunded	85,071,016	85,194,318
	(f) Deferred Benefits for DROP Members	1,172,501,053	1,219,407,826
	(g) Account Balances for DROP Members	1,037,139,136	1,023,194,560
	(h) Account Balances for ORP Members	5,617,170	5,571,593
	(i) Total	$ 13,691,673,246	$ 13,327,347,644
	(j) Ratio of Inactive Liability to Total Accrued Liability	73.71%	73.16%
3	**Total Accrued Liability**	$ 18,576,266,623	$ 18,216,660,456
B.	**Valuation Assets**	$ 11,630,816,397	$ 11,318,433,015
C.	**Unfunded Accrued Liability**	6,945,450,226	6,898,227,441
D.	**Funded Ratio = B / A3**	62.61%	62.13%

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**	**$**	**6,898,227,442**
B.	**Increases in the UAL Due to:**		
	1. Interest on the UAL	534,612,627	
	2. Permanent Benefit Increase	120,572,581	
	3. Employer Contribution Shortfall	-	
	4. Assumption Change (Discount Rate)	-	
	5. Investment Loss	249,797,074	
	6. Experience Loss	-	
	7. Harbor Police	3,358,474	
	8. Total Increases	**$**	**908,340,756**
C.	**Decreases in the UAL Due to:**		
	1. Employer Amortization Payment	644,434,960	
	2. Experience Account Disbursement	120,572,581	
	3. Employer Contribution Surplus	15,271,071	
	4. Investment Gain	-	
	5. Experience Gain	80,839,360	
	6. Total Decreases	**$**	**861,117,972**
D.	**Unfunded Accrued Liability on June 30, 2016**		
	= A + B8 – C6	**$**	**6,945,450,226**

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 8.15% to 7.25%. The discount rate will be changed from 7.75% to 7.25%.
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	$ 4,884,593,377	$ 5,259,436,053	$ 374,842,676
B.	Accrued Liability for Retired and Inactive	13,691,673,246	14,559,084,656	867,411,410
C.	Accrued Liability on June 30, 2016 = A + B	18,576,266,623	19,818,520,709	1,242,254,086
D.	Interest Adjustment	1,439,660,663	1,436,842,751	(2,817,912)
E.	Normal Cost	223,042,664	251,497,559	28,454,895
F.	Interest Adjustment for One Half Year	8,481,638	8,957,276	475,638
G.	Estimated Benefit Payments	1,274,505,193	1,274,505,193	-
H.	Interest Adjustment for One-Half Year	48,465,577	45,392,470	(3,073,107)
I.	Projected Accrued Liability on June 30, 2017 = C + D + E + F – G – H	$ 18,924,480,818	$ 20,195,920,632	$ 1,271,439,814

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**		**$ 6,945,450,226**
B.	**Increases in the UAL Due to:**		
	1. Interest on the UAL	538,272,393	
	2. Expected Employer Contribution Shortfall	31,102,411	
	3. Recognition of Gain Sharing	-	
	4. Change in Assumptions	1,271,439,814	
	5. Total Increases = B1 + B2 + B3 + B4		**$ 1,840,814,618**
C.	**Decreases in the UAL Due to:**		
	1. Employer Amortization Payment	652,149,109	
	2. Employer Contribution Surplus	-	
	3. Total Decreases = C1 + C2		**$ 652,149,109**
D.	**Unfunded Accrued Liability on June 30, 2017** = A + B5 – C3		**$ 8,134,115,735**

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	$11,415,150,926	$11,624,853,426	$10,327,598,351	$ 9,515,774,342
2. Contributions	886,025,786	888,347,447	786,502,145	856,194,404
3. Legislative Appropriations	10,790,721	4,540,773	2,465,608	-
4. Benefit Payments	1,274,505,193	1,237,388,009	1,244,595,931	1,131,933,021
5. Administrative Expenses	17,018,181	18,011,841	17,638,128	18,932,247
6. EOY Market Value	$10,723,714,826	$11,415,150,926	$11,624,853,426	$10,327,598,351
7. Actual Investment Income = A6 – A1 – A2 – A3 + A4 + A5	(296,729,233)	152,809,130	1,770,521,381	1,106,494,873
8. Expected Investment Income Based on the Discount Rate	869,797,447	886,702,860	807,178,592	749,475,113
9. Gain/(Loss) = A7 – A8	$(1,166,526,680)	$ (733,893,730)	$ 963,342,789	$ 357,019,760

B. Market Value Adjustment	Gain/(Loss) (a)	Factor (b)	Market Value Adjustment (c) = (a) x (b)
1. Adjustment for 2016	$(1,166,526,680)	80%	$ (933,221,344)
2. Adjustment for 2015	(733,893,730)	60%	(440,336,238)
3. Adjustment for 2014	963,342,789	40%	385,337,116
4. Adjustment for 2013	357,019,760	20%	71,403,953
5. Total Market Value Adjustment			$ (916,816,513)

C. Preliminary Actuarial Value	
1. Market Value on June 30, 2015 = A6	10,723,714,826
2. Market Value Adjustment = B5	(916,816,513)
3. Preliminary Actuarial Value = C1 – C2	11,640,531,339
D. Corridor Values	
1. 80% x Market Value	8,578,971,861
2. 120% x Market Value	12,868,457,791
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	$11,640,531,339

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	$10,939,277,086
	2. Contributions for FYE 2016	813,770,655
	3. Legislative Appropriations	10,790,721
	4. Benefits Paid for FYE 2016	1,207,267,337
	5. Administrative Expenses Paid for FYE 2016	17,018,181
	6. Net Actuarial Value of Assets on June 30, 2016	$11,122,775,487
	7. Expected Rate of Return on Assets	7.75%
B.	Actual Investment Earnings = A6 – A1 – A2 – A3 + A4 + A5	$ 583,222,543
C.	Expected Investment Earnings	$ 833,019,617
D.	Investment Gain/(Loss) = B – C	$ (249,797,074)

C. Allocation of Investment Gains to the Experience Account

According to R.S. 11:542, 50% of the total investment gain, not associated with DROP accounts, in excess of $100 million will be transferred from the regular asset pool to the Experience Account. Beginning June 30, 2016, the $100 million hurdle will be indexed by the increase in the actuarial value of assets, if any. Moreover, the transfer to the Experience Account will be 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. 11:542 from the regular pool of assets to the Experience Account is calculated below.

A.	**Excess Investment Earnings = 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	$ 1,016,160,903
	b. DROP accounts for Actives not entitled to system earnings	78,322,934
	c. Self-directed DROP accounts not entitled to system earnings	512,138,682
	d. DROP accounts entitled to system earnings = B1a – B1b – B1c	$ 425,699,287
	2. Rate of Return Attributable to Excess Earnings on DROP Accounts	
	a. Adjusted Actual rate of return on investments for DROP accounts	4.927946%
	b. Adjusted Expected rate of return for DROP accounts	7.250000%
	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.	**Benefit Disbursements**	$ 120,572,581
D.	**Actuarial Return Gain/(Loss) Paid to the Experience Account (EA)**	
	1. Experience Account Assets Entitled to System Earnings	$ 123,579,684
	2. Actuarial Rate of Return on the Actuarial Value of Assets	5.427946%
	3. Preliminary Investment Earnings Payable to the EA = D1 x D2	6,707,839
	4. Maximum Fund in the Experience Account = Present Value of a 1.5% PBI	120,572,581
	5. Maximum Investment Earnings Payable to the Experience Account = D4 - (D1 - C)	117,565,478
	6. Investment Earnings Payable to the EA = lesser of D5 and D3	6,707,839
	7. Investment Earnings to be Treated as an Investment Gain = D6 - D3	0
	8. Experience Account End of Period = lesser of D4 and (D1 - C + D3)	9,714,942
	9. Maximum Excess Investment Earnings that Can be Applied to EA = D4 - D8	$ 110,857,639
E.	**Net Excess Investment Earnings = A – B3 + D7**	$ 0
F.	**Allocation of Excess Investment Earnings to the Experience Account**	
	1. Net Excess Investment Earnings = E	$ 0
	2. Administrative Expense	0
	3. Threshold Gain	101,734,998
	4. Gain Available for Gain Sharing = F1 – F2 – F3, but not less than 0	0
	5. Gain Sharing Percentage	50%
	6. Preliminary Allocation of Excess Gains to the Experience Account	0
	7. Maximum Excess Investment Earnings that Can be Applied to EA = D9	110,857,639
	8. Allocation of Excess Gains to the Experience Account = lesser F6 and F7	$ 0

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 Original Amortization Base (OAB), 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	$ 708,359,669
	2. ORP Contributions	443,488
	3. Net Employer Contributions = A1 + A2	$ 708,803,157
B.	**Expected Employer Contributions**	
	1. Member Contributions	$ 152,233,771
	2. Employee Contribution Rate	7.98000000%
	3. Salaries on which Contributions were Received = B1 / B2	$ 1,907,691,366
	4. Employer Normal Cost Rate for FYE 2016	3.99548880%
	5. Members Affected by Act 852 of the 2014 Session	0.00307874%
	6. Total Employer Normal Cost Rate = B4 + B5	3.99856754%
	7. Expected Employer Normal Costs = B3 x B6	$ 76,280,328
	8. Contributions to the Employer Credit Account for FYE 2016	0
	9. Amortization Payments for FYE 2016	539,009,230
	10. Payments toward Contribution Variances for FYE 2016	78,801,967
	11. Expected Employer Contributions	$ 694,091,525
C.	**Mid-Year Employer Shortfall/(Surplus) for FYE 2016 = B11 – A3**	$ (14,711,633)
D.	**Interest at 7.75% for 1/2 Year and Adjustment for Rounding**	$ (559,439)
E.	**Employer Shortfall/(Surplus) on June 30, 2016 = C + D**	$ (15,271,072)

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, 37.4% of pay for FYE 2017, is less than the projected 35.8% rate of pay established by PRSAC a year ago. The expected surplus of employer contributions is calculated below.

A.	Actual Employer Contributions Required in Mid-Year for FYE 2017	$	700,385,309
B.	Projected Employer Contributions Expected in Mid-Year for FYE 2017		670,422,301
C.	Shortfall/(Surplus) of Employer Contributions Expected for Mid-Year for FYE 2017 = A - B	$	29,963,008
D.	Interest on Shortfall at 7.75% per Year from Mid-Year to End of Year		1,139,403
E.	Total Employer Contribution Shortfall/(Surplus) on June 30, 2017 = C + D	$	31,102,411

E. Asset Allocation (Market Values)

		June 30, 2016	June 30, 2015
A.	**Short-Term Assets**		
	1. Cash/Cash Equivalents	$ 52,222,180	$ 72,437,860
	2. Short-Term Investments	317,630,817	356,969,322
B.	**Bonds**		
	1. Domestic Issues	1,302,223,446	1,304,120,351
	2. International Issues	343,290,464	295,597,356
C.	**Equities**		
	1. Domestic Stock	2,432,754,709	2,863,226,182
	2. International Stock	3,202,542,903	3,288,387,047
D.	**Other Assets**		
	1. Fixed Assets	4,331,820	4,304,276
	2. Real Estate and Alternative Investments	3,040,659,840	3,182,457,173
E.	**Receivables Minus Payables**	28,699,953	48,844,979
F.	**Securities Lending (Assets minus Liabilities)**	(641,306)	(1,193,620)
G.	**Total Assets**	$ 10,723,714,826	$ 11,415,150,926

F. Income Statement (Market Value)

	FYE June 30, 2016	FYE June 30, 2015
A. Income		
1. Contribution Income		
a. Member Contributions	$ 152,233,771	$ 153,281,097
b. Employer Contributions	718,163,026	721,640,155
c. ORP Contributions	443,488	497,206
d. Total = A1a + A1b + A1c	$ 870,840,285	$ 875,418,458
2. Other Income		
a. Legislative Appropriations	$ 10,790,721	$ 4,540,773
b. Transfers/Purchases	10,578,354	9,341,467
c. Miscellaneous	4,607,147	3,587,522
d. Total = A2a + A2b + A2c	$ 25,976,222	$ 17,469,762
3. Net Investment Income		
a. Investments Income	$ (229,507,349)	$ 226,006,463
b. Investment Expense	67,221,884	73,197,333
c. Net Investment Income = A3a – A3b	$ (296,729,233)	$ 152,809,130
Total Income = A1d + A2e + A3c	$ 600,087,274	$ 1,045,697,350
B. Expense		
1. Operating Expense		
a. General Administration	$ 15,615,605	$ 15,877,682
b. Post-Employment Benefits	982,858	940,845
c. Other Expenses	419,718	1,193,314
d. Total = B1a + B1b + B1c	$ 17,018,181	$ 18,011,841
2. Benefit Payments		
a. Pension Benefits	$ 1,238,507,932	$ 1,199,079,252
b. Return of Employee Contributions	35,997,261	38,308,757
c. Total = B2a + B2b	$ 1,274,505,193	$ 1,237,388,009
3. Total Expense = B1d + B2c	$ 1,291,523,374	$ 1,255,399,850
C. Net Income = A4 – B3	$ (691,436,100)	$ (209,702,500)

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	$ -	$ -
	2. Allocation for Current Year	-	-
	3. Disbursements for Current Year	-	-
	4. Accumulated Interest for Current Year	-	-
	5. Ending Balance for Current Year = A1 + A2 – A3 + A4	$ -	$ -
B.	**Initial UAL Amortization Fund**		
	1. Beginning Balance for Current Year	$ -	$ -
	2. Allocation for Current Year	-	-
	3. Disbursements for Current Year	-	-
	4. Accumulated Interest	-	-
	5. Ending Balance for Current Year = B1 + B2 – B3 + B4	$ -	$ -
C.	**Experience Account Fund**		
	1. Beginning Balance for Current Year	$ 123,579,684	$ 117,093,356
	2. Allocation for Current Year	-	-
	3. Disbursements for Current Year	120,572,581	-
	4. Accumulated Interest	6,707,839	6,486,328
	5. Ending Balance for Current Year = C1 + C2 - C3 + C4	$ 9,714,942	$ 123,579,684
D.	**Valuation Assets**		
	1. Actuarial Value of Assets	$ 11,640,531,339	$ 11,442,012,699
	2. Employer Credit Account = A5	-	-
	3. Initial UAL Amortization Fund = B5	-	-
	4. Experience Account Fund = C5	9,714,942	123,579,684
	5. Valuation Assets = D1 – D2 – D3 – D4	$ 11,630,816,397	$ 11,318,433,015

6. Rates of Return on Investments

A. Rates of Return on Investments Based on Market Values

The market 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.

		Market Value (a)	Self-Directed & ORP Values (b)	Net Market Value (c) = (a) – (b)
A.	Asset Value on June 30, 2015	$ 11,415,150,926	$ 502,735,613	$ 10,912,415,313
B.	Contributions	896,816,507	72,255,131	824,561,376
C.	Benefit Payments	1,274,505,193	67,237,856	1,207,267,337
D.	Administrative Expenses	17,018,181	-	17,018,181
E.	Asset Value on June 30, 2016	$ 10,723,714,826	$ 517,755,852	$ 10,205,958,974
F.	Investment Income = E – A – B + C + D	$ (296,729,233)	$ 10,002,964	$ (306,732,197)
G.	Unrounded Rates of Return	-2.643893%	1.979827%	-2.861855%
H.	Rounded Rate of Return on Investments	-2.64%	1.98%	-2.86%

B. Rates of Return on Investments Based on Actuarial Values

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	$ 11,442,012,699	$ 502,735,613	$ 10,939,277,086
B.	Contributions	896,816,507	72,255,131	824,561,376
C.	Benefit Payments	1,274,505,193	67,237,856	1,207,267,337
D.	Administrative Expenses	17,018,181	-	17,018,181
E.	Asset Value on June 30, 2016	$ 11,640,531,339	$ 517,755,852	$ 11,122,775,487
F.	Investment Income = E – A – B + C + D	$ 593,225,507	$ 10,002,964	$ 583,222,543
G.	Unrounded Rates of Return	5.273090%	1.979827%	5.427946%
H.	Rounded Rate of Return on Investments	5.27%	1.98%	5.43%

C. Rate of Return to Be Granted on Drop Accounts

A.	Rounded Rate of Return on the Net Actuarial Value of	5.43%
B.	Reduction for Administrative Expenses	0.50%
C.	Rate of Return to Be Granted on DROP Accounts	4.93%

D. Summary of Rates of Return on Investments

		Rates Measured on June 30				
		2016	**2015**	**2014**	**2013**	**2012**
A.	Total Market Value	-2.64%	1.34%	17.55%	11.81%	-0.10%
B.	Market Value Net of Self-Directed and ORP Accounts	-2.86%	1.30%	18.19%	12.19%	-0.20%
C.	Actuarial Value Net of Self-Directed and ORP Accounts	5.43%	10.64%	13.45%	14.05%	5.20%
D.	Five-Year Geometric Average of the Actuarial Value Net of Self-Directed and ORP Accounts	9.69%	9.69%	7.97%	3.62%	2.59%
E.	Interest Credited to Self-Directed and ORP Accounts	4.93%	10.14%	12.95%	13.55%	4.78%

7. Amortization Payments for June 30, 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	OAB	I	19	$ 1,936,750,759	13	$ 1,653,893,277	$ 189,244,961	$ 1,585,628,631
2010	EAAB	I	30	2,493,227,298	24	2,420,603,023	214,510,835	2,385,531,724
2009	Assumption Change	L	30	(221,451,744)	23	(204,050,819)	(18,570,638)	(200,587,934)
2009	Change in Liability	L	30	1,381,087,874	23	1,272,566,665	115,816,125	1,250,970,320
2010	Change in Liability	L	30	630,583,407	24	589,636,071	52,830,615	580,493,263
2011	Change in Liability	L	30	86,983,753	25	82,432,273	7,281,045	81,262,853
2012	Assumption Change	L	30	357,645,630	26	343,100,707	29,911,445	338,642,125
2012	Change in Liability	L	30	272,743,878	26	261,651,784	22,810,746	258,251,628
2013	Asset Method Change	L	30	(85,105,147)	27	(82,592,724)	(7,114,611)	(81,608,502)
2013	Change in Liability	L	30	(539,829,321)	27	(523,892,798)	(45,128,597)	(517,649,789)
2014	Liability Gain	L	30	(61,187,556)	28	(60,012,906)	(5,113,018)	(59,356,456)
2014	Assumption Change	L	30	725,253,130	28	711,330,056	60,604,358	703,549,177
2014	Funding Method Change	L	30	622,016,608	28	610,075,421	51,977,601	603,402,114
2014	Reduction in EA Deposit	L	5	(181,814,713)	3	(117,108,100)	(43,579,816)	(80,946,953)
2014	Gain from $50 to $100 M	L	5	(50,000,000)	3	(32,205,342)	(11,984,678)	(22,260,837)
2014	Remaining Investment Gain	L	5	(186,404,837)	3	(120,064,630)	(44,680,039)	(82,990,553)
2015	Remaining Gains	L	30	(181,167,204)	29	(179,493,093)	(15,138,883)	(177,689,239)
2015	Experience Loss	L	30	27,584,310	29	27,329,412	2,305,029	27,054,759
2016	Other Experience Gain	L	30	(80,839,360)	30	(80,839,353)	(6,755,182)	(80,092,341)
2016	Investment Experience Loss	L	30	249,797,074	30	249,797,074	20,873,804	247,488,776
Total				$ 7,195,873,839		$ 6,822,155,998	$ 570,101,102	$ 6,759,092,766
Plan Specific Bases								
2007	Act 414 Liab Change	L	30	3,631,308	21	3,234,419	305,122	3,168,362
2008	Act 262 Liab Change	L	10	1,999,338	2	532,156	286,499	276,004
2008	Act 740 Liab Change	L	10	565,160	2	150,427	80,986	78,019
2010	Act 992 2010 Change	L	10	5,036,841	4	2,485,594	718,942	1,931,946
2011	Act 992 2011 Change	L	10	452,190	5	268,774	64,423	222,731
2012	Act 992 2012 Change	L	10	533,971	6	367,175	75,937	316,806
2014	Act 852 2014 Change	L	10	5,278,524	2	1,213,580	721,309	558,894
2016	Harbor Police	L	6	3,358,474	6	3,358,474	694,576	2,897,767
Total				$ 20,855,806		$ 11,610,599	$ 2,947,794	$ 9,450,529
Total Outstanding Balances						$ 6,833,766,597	$ 573,048,896	$ 6,768,543,295
Employers Credit Balance								
2012	Contribution Variance	L	5	50,918,231	1	11,782,192	12,230,233	-
2013	Contribution Variance	L	5	78,318,188	2	34,904,414	18,791,664	18,103,252
2014	Contribution Variance	L	5	100,910,314	3	64,997,023	24,187,552	44,926,961
2015	Contribution Variance	L	5	-	4	-	-	-
2016	Contribution Variance	L	5	-	5	-	-	-
Total				$ 230,146,733		$ 111,683,629	$ 55,209,449	$ 63,030,213
Grand Total						**$6,945,450,226**	**$ 628,258,345**	**$6,831,573,508**

8. Amortization Payments for June 30, 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	OAB	I	19	$ 1,936,750,759	12	$ 1,585,628,631	$ 198,266,840	$ 1,495,258,443
2010	EAAB	I	30	2,493,227,298	23	2,385,531,724	224,415,570	2,326,074,473
2009	Assumption Change	L	30	(221,451,744)	22	(200,587,934)	(17,875,250)	(196,618,669)
2009	Change in Liability	L	30	1,381,087,874	22	1,250,970,321	111,479,325	1,226,215,924
2010	Change in Liability	L	30	630,583,407	23	580,493,263	50,793,084	569,976,906
2011	Change in Liability	L	30	86,983,753	24	81,262,854	6,992,377	79,912,995
2012	Assumption Change	L	30	357,645,630	25	338,642,124	28,694,514	333,477,187
2012	Change in Liability	L	30	272,743,878	25	258,251,629	21,882,703	254,312,800
2013	Asset Method Change	L	30	(85,105,147)	26	(81,608,501)	(6,818,059)	(80,464,228)
2013	Change in Liability	L	30	(539,829,321)	26	(517,649,789)	(43,247,537)	(510,391,568)
2014	Liability Gain	L	30	(61,187,556)	27	(59,356,455)	(4,894,995)	(58,590,464)
2014	Assumption Change	L	30	725,253,130	27	703,549,176	58,020,141	694,469,919
2014	Funding Method Change	L	30	622,016,608	27	603,402,113	49,761,234	595,615,248
2014	Reduction in EA Deposit	L	5	(181,814,713)	2	(80,946,953)	(43,381,237)	(41,889,314)
2014	Gain from $50 to $100 M	L	5	(50,000,000)	2	(22,260,837)	(11,930,068)	(11,519,781)
2014	Remaining Investment Gain	L	5	(186,404,837)	2	(82,990,553)	(44,476,445)	(42,946,861)
2015	Remaining Gains	L	30	(181,167,204)	28	(177,689,239)	(14,479,413)	(175,576,601)
2015	Experience Loss	L	30	27,584,310	28	27,054,760	2,204,619	26,733,092
2016	Other Experience Gain	L	30	(80,839,360)	29	(80,092,341)	(6,454,949)	(79,214,189)
2016	Investment Experience Loss	L	30	249,797,074	29	247,488,776	19,946,070	244,775,248
2017	Assum Change: Mortality	L	30	(10,491,426)	30	(10,491,426)	(836,988)	(10,385,256)
2017	Assum Change: Disc Rt	L	30	1,424,810,418	30	1,424,810,418	113,668,890	1,410,391,880
2017	Assum Change: Admin Exp	L	30	(264,703,667)	30	(264,703,667)	(21,117,597)	(262,024,967)
2017	Assum Change: COLA	L	30	121,830,889	30	121,830,889	9,719,456	120,598,007
Total				$ 8,467,320,053		$ 8,030,538,983	$ 680,332,285	$ 7,908,190,224
Plan Specific Bases								
2007	Act 414 Liab Change	L	30	3,631,308	20	3,168,362	294,421	3,093,161
2008	Act 262 Liab Change	L	10	1,999,338	1	276,004	285,834	-
2008	Act 740 Liab Change	L	10	565,160	1	78,019	80,798	-
2010	Act 992 2010 Change	L	10	5,036,841	3	1,931,946	714,103	1,332,476
2011	Act 992 2011 Change	L	10	452,190	4	222,731	63,854	172,751
2012	Act 992 2012 Change	L	10	533,971	5	316,806	75,109	261,990
2014	Act 852 2014 Change	L	10	5,278,524	1	558,894	578,799	-
2016	Harbor Police	L	6	3,358,474	5	2,897,767	687,007	2,396,380
Total				$ 20,855,806		$ 9,450,529	$ 2,779,925	$ 7,256,758
Total Outstanding Balances						$ 8,039,989,512	$ 683,112,210	$ 7,915,446,982
Employers Credit Balance								
2013	Contribution Variance	L	5	78,318,188	1	18,103,252	18,748,014	-
2014	Contribution Variance	L	5	100,910,314	2	44,926,961	24,077,337	23,249,296
2015	Contribution Variance	L	5	-	3	-	-	-
2016	Contribution Variance	L	5	-	4	-	-	-
2017	Contribution Variance	L	5	31,102,411	5	31,102,411	7,373,811	25,720,901
Total				$ 210,330,913		$ 94,132,624	$ 50,199,162	$ 48,970,197
Grand Total						**$ 8,134,122,136**	**$ 733,311,372**	**$ 7,964,417,179**

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 LASERS 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 LASERS 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 in accordance with the following assumptions and methods.

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

2. The LASERS board and the legislature will grant a COLA 50% of the time if there are sufficient funds in the Experience Account and if all other necessary conditions have been satisfied.

Using stochastic modeling, we can then calculate a deterministic assumption for an automatic COLA whose actuarial present value equals the estimated transfers to the Experience Account. We have determined that the automatic COLA assumption should be 40 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 as we refine our assumptions, methods and procedures.

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

If the automatic COLA used to value plan liabilities is 40 basis points, 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 $102 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 LASERS gain sharing/COLA program are contained in R.S. 11:102.1 and 11:542. According to R.S. 542, 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 LASERS' interpretation of the law. On each valuation date, LASERS 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 LASERS, increases the investment gain that otherwise would be calculated. Under LASERS' 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 LASERS that exceeds a specified threshold (currently set at $102 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 $102 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 a 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 LASERS 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 LASERS 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 LASERS' 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 LASERS' actuary.

4. The LASERS' board of trustees must approve the COLA.

5. The LASERS' 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, it is more likely than not 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-third 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 LASERS' 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 plant shutdown or a change in control of the plan sponsor.*
>
> *For such **plan provisions**, the actuary **should consider** using alternative valuation procedures, such as stochastic modeling, option-pricing techniques, or deterministic procedures in conjunction with assumptions that are adjusted to reflect the impact of variations in experience from year to year. When selecting alternative valuation procedures for such **plan provisions**, the actuary should use professional judgment based on the purpose of the measurement and other relevant factors.*

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

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

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

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

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SECTION III
BASIS FOR THE VALUATION

1. Introduction

The June 30, 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 LASERS. The accuracy of the data was audited by Financial Audit Services within the Louisiana Legislative Auditor. A comparison of these census numbers with census summaries prepared by the LASERS actuary confirms the reasonability of the census data used in preparing this report.

	June 30 Valuation Date		
Membership Status	**2016**	**2015**	**2014**
Rank and File Including Appellate Law Clerks	32,481	33,271	33,397
Legislators	8	9	11
Special Legislators	0	1	1
Judges Prior 2011	219	229	273
Judges Post 2011	88	81	30
Wildlife	160	169	180
Corrections Primary	237	266	306
Corrections Secondary	1,895	2,060	2,314
Peace Officers	57	62	67
Alcohol Tobacco Control	12	12	16
Bridge Police	5	5	7
Harbor Police	32	N/A	N/A
Hazardous Duty Plan	2,440	2,272	1,969
Post DROP	1,650	1,757	1,750
Total Active Members	**39,284**	**40,194**	**40,321**
DROP Participants	1,609	1,682	1,838
Regular Retirees	39,998	39,352	38,675
Disability Retirees	2,401	2,457	2,506
Survivors	5,802	5,834	5,759
Terminated Vested & Reciprocal	3,865	3,953	4,558
Total Inactive Members	**53,675**	**53,278**	**53,336**
Total Active and Inactive Members	**92,959**	**93,472**	**93,657**
Terminated Due Refund	52,837	52,193	52,042
Total Members	**145,796**	**145,665**	**145,699**

Membership Reconciliation

	Active (Pre DROP)	Active (After DROP)	Terminated Vested	In DROP	Retired, Disabled, Survivor	Total
Members on June 30, 2015	**38,437**	**1,757**	**3,953**	**1,682**	**47,643**	**93,472**
Additions to Census						
Initial Membership	3,792	0	0	0	0	3,792
Rehired Members	487	0	0	0	0	487
Data Revisions	0	8	5	0	129	142
Total Additions	**4,279**	**8**	**5**	**0**	**129**	**4,421**
Change in Status						
Active to Term Vested	(568)	0	568	0	0	0
Active to In DROP	(536)	0	0	536	0	0
Active to Retired	(918)	0	0	0	918	0
Disabled to Active	0	0	0	0	0	0
Terminated Vested to Active	119	0	(119)	0	0	0
Terminated Vested to Retiree	0	0	(185)	0	185	0
In DROP to Active After	0	292	0	(292)	0	0
In DROP to Retiree	0	0	0	(311)	311	0
Active After DROP to Retiree	0	(413)	0	0	413	0
Data Revisions	(1)	12	0	2	(11)	2
Total Changes	**(1,904)**	**(109)**	**264**	**(65)**	**1,816**	**2**
Eliminated from Census						
Refunded	(1,633)	0	(247)	0	0	(1,880)
Terminated, Due Refund	(1,498)	0	0	0	0	(1,498)
Deceased	(29)	(3)	(8)	(1)	(1,264)	(1,305)
Data Revisions	(18)	(3)	(102)	(7)	(123)	(253)
Total Eliminated	**(3,178)**	**(6)**	**(357)**	**(8)**	**(1,387)**	**(4,936)**
Members on June 30, 2016	**37,634**	**1,650**	**3,865**	**1,609**	**48,201**	**92,959**

LASERS MEMBERSHIP PROFILE
Regular Members Before July 2006

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)	-	-	-	-	-	-	-	-	-	-
	$ -	-	-	-	-	-	-	-	-	$ -
[25-29)	-	1	1	7	-	-	-	-	-	9
	-	19,188	19,386	265,661	-	-	-	-	-	304,235
[30-34)	2	9	30	365	26	-	-	-	-	432
	50,600	257,442	1,134,331	16,184,592	1,156,105	-	-	-	-	18,783,070
[35-39)	7	21	70	1087	405	32	2	-	-	1624
	168,260	706,730	3,271,076	53,519,085	19,943,931	1,843,829	98,857	-	-	79,551,768
[40-44)	2	25	48	823	936	347	23	-	-	2204
	19,608	1,027,079	2,098,918	40,362,916	51,271,632	18,945,722	1,596,462	-	-	115,322,337
[45-49)	5	12	44	731	924	873	477	9	-	3075
	80,623	423,967	1,891,071	35,951,368	49,311,122	51,381,045	29,410,976	966,595	-	169,416,767
[50-54)	3	13	37	719	844	870	904	144	19	3553
	75,857	531,750	1,579,625	32,275,385	42,699,574	48,360,305	56,654,676	10,056,977	1,318,156	193,552,305
[55-59)	3	12	27	765	738	806	273	111	64	2799
	78,489	476,072	958,478	35,019,323	34,820,943	42,859,631	17,675,118	7,988,205	4,155,146	144,031,405
[60-64)	2	9	29	392	327	211	131	79	65	1245
	59,992	338,580	1,218,053	19,428,782	16,437,376	12,359,037	8,422,611	6,290,515	5,064,772	69,619,718
[65-69)	-	2	6	125	158	108	79	31	35	544
	-	137,524	227,847	6,062,099	8,090,468	6,160,718	4,578,238	2,147,943	2,794,929	30,199,766
[70+	1	-	2	39	37	42	30	14	13	178
	11,048	-	53,256	1,668,417	1,948,275	2,664,015	1,627,045	810,424	706,639	9,489,119
TOTAL	25	104	294	5053	4395	3289	1919	388	196	15,663
	$544,476	3,918,332	12,452,041	240,737,628	225,679,426	184,574,302	120,063,983	28,260,659	14039642	$830,270,489

AVERAGES	Attained Age	50.51
	Service Years	18.26
	Annual Salary	$53,008

LASERS MEMBERSHIP PROFILE
Regular Members After July 2006

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)	545	485	9	-	-	-	-	-	-	1039
	$11,488,656	12,375,657	242,607	-	-	-	-	-	-	$24,106,920
[25-29)	680	1543	311	1	-	-	-	-	-	2535
	18,182,336	51,467,821	11,474,543	49,295	-	-	-	-	-	81,173,995
[30-34)	528	1459	1175	18	1	-	-	-	-	3181
	15,179,472	53,869,433	53,233,528	907,280	27,364	-	-	-	-	123,217,077
[35-39)	379	1017	1014	28	5	-	-	-	-	2443
	11,895,385	39,092,748	46,881,031	1,579,684	353,594	-	-	-	-	99,802,442
[40-44)	286	753	773	38	9	1	-	-	-	1860
	9,003,497	30,546,513	35,669,203	2,437,694	504,862	50,502	-	-	-	78,212,271
[45-49)	265	749	717	31	5	2	1	-	-	1770
	9,331,330	30,474,801	32,963,052	1,755,752	230,868	92,932	49,185	-	-	74,897,920
[50-54)	223	652	760	31	13	3	2	-	-	1684
	7,355,928	24,666,672	34,176,401	1,767,947	600,452	149,823	108,372	-	-	68,825,595
[55-59)	148	453	688	27	9	5	1	-	-	1331
	4,594,355	17,506,831	29,005,533	1,721,918	597,231	372,000	55,526	-	-	53,853,394
[60-64)	35	183	379	20	2	2	1	-	-	622
	1,428,237	7,862,113	16,803,301	1,286,351	206,420	149,980	70,848	-	-	27,807,250
[65-69)	12	46	108	4	1	-	-	-	-	171
	572,239	2,066,128	5,690,763	316,983	125,609	-	-	-	-	8,771,722
[70+	2	15	20	2	-	-	-	-	-	39
	49,571	670,923	1,219,870	128,586	-	-	-	-	-	2,068,950
TOTAL	3103	7355	5954	200	45	13	5	-	-	16,675
	$89,081,007	270,599,640	267,359,832	11,951,490	2,646,400	815,237	283,931	-	-	$642,737,537

AVERAGES		
	Attained Age	40.15
	Service Years	4.22
	Annual Salary	$38,545

LASERS MEMBERSHIP PROFILE
Appellate Law Clerks

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)	-	-	-	-	-	-	-	-	-	-
	$ -	-	-	-	-	-	-	-	-	$ -
[25-29)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[30-34)	-	-	6	-	-	-	-	-	-	6
	-	-	374,331	-	-	-	-	-	-	374,331
[35-39)	-	-	8	4	-	-	-	-	-	12
	-	-	539,272	281,442	-	-	-	-	-	820,714
[40-44)	-	1	3	9	7	1	-	-	-	21
	-	62,015	202,670	629,554	501,017	66,294	-	-	-	1,461,550
[45-49)	-	-	5	6	17	5	-	-	-	33
	-	-	384,145	425,759	1,354,771	429,276	-	-	-	2,593,951
[50-54)	-	-	3	4	5	5	6	1	-	24
	-	-	227,027	358,794	407,151	416,237	552,281	87,839	-	2,049,329
[55-59)	-	-	2	6	7	2	6	5	1	29
	-	-	135,691	467,178	569,253	179,696	576,785	507,141	113,858	2,549,602
[60-64)	-	-	1	1	2	2	2	2	3	13
	-	-	65,415	107,621	159,924	163,433	170,384	210,033	311,414	1,188,224
[65-69)	-	-	1	2	-	-	1	-	-	4
	-	-	65,432	151,746	-	-	96,024	-	-	313,202
[70+	-	-	-	1	-	-	-	-	-	1
	-	-	-	68,841	-	-	-	-	-	68,841
TOTAL	-	1	29	33	38	15	15	8	4	143
	$ -	62,015	1,993,983	2,490,935	2,992,116	1,254,936	1,395,474	805,013	425272	$11,419,744

AVERAGES	Attained Age	50.27
	Service Years	17.06
	Annual Salary	$79,858

LASERS MEMBERSHIP PROFILE
Participating Legislators

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)	1	-	-	-	-	-	-	-	-	1
	62,404	-	-	-	-	-	-	-	-	62,404
[55-59)	1	1	-	-	-	-	-	-	-	2
	109,876	26,729	-	-	-	-	-	-	-	136,605
[60-64)	-	-	-	-	-	1	-	1	-	2
	-	-	-	-	-	45,994	-	44,459	-	90,453
[65-69)	-	-	-	1	-	-	-	1	-	2
	-	-	-	44,466	-	-	-	44,145	-	88,611
[70+	-	-	-	1	-	-	-	-	-	1
	-	-	-	95,885	-	-	-	-	-	95,885
TOTAL	2	1	-	2	-	1	-	2	-	8
	$172,280	26,729	-	140,351	-	45,994	-	88,604	-	$473,958

AVERAGES		
	Attained Age	62.38
	Service Years	14.95
	Annual Salary	$59,245

LASERS MEMBERSHIP PROFILE
Active Judges Pre-2011

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)	-	-	1	-	-	-	-	-	-	1
	-	-	119,503	-	-	-	-	-	-	119,503
[40-44)	-	-	6	2	-	-	-	-	-	8
	-	-	745,802	167,773	-	-	-	-	-	913,575
[45-49)	-	-	16	4	6	2	-	-	-	28
	-	-	2,183,588	522,394	877,361	248,190	-	-	-	3,831,533
[50-54)	-	-	14	10	10	9	1	-	-	44
	-	-	1,958,509	1,377,861	1,424,076	1,347,351	148,108	-	-	6,255,905
[55-59)	-	1	12	13	9	13	5	-	-	53
	-	148,108	1,719,545	1,872,204	1,320,314	1,963,980	735,330	-	-	7,759,481
[60-64)	-	-	5	5	14	14	8	-	-	46
	-	-	746,491	660,553	2,113,802	2,108,856	1,138,898	-	-	6,768,600
[65-69)	-	-	-	7	6	10	7	-	-	30
	-	-	-	1,041,867	900,550	1,484,812	1,016,679	-	-	4,443,908
[70+	-	-	-	3	-	1	3	1	1	9
	-	-	-	419,486	-	154,059	457,978	148,108	154,059	1,333,690
TOTAL	-	1	54	44	45	49	24	1	1	219
	$ -	148,108	7,473,438	6,062,138	6,636,103	7,307,248	3,496,993	148,108	154059	$31,426,195

AVERAGES		
	Attained Age	57.71
	Service Years	15.76
	Annual Salary	$143,499

LASERS MEMBERSHIP PROFILE
Active Judges Post 2011

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)	-	1	-	-	-	-	-	-	-	1
	-	154,801	-	-	-	-	-	-	-	154,801
[35-39)	2	5	1	1	-	-	-	-	-	9
	207,106	724,457	148,108	148,108	-	-	-	-	-	1,227,779
[40-44)	1	15	-	-	-	-	-	-	-	16
	62,191	2,162,591	-	-	-	-	-	-	-	2,224,782
[45-49)	1	19	1	2	-	-	-	-	-	23
	95,094	2,716,440	147,934	292,546	-	-	-	-	-	3,252,014
[50-54)	2	15	-	-	-	-	-	-	-	17
	276,234	2,203,081	-	-	-	-	-	-	-	2,479,315
[55-59)	-	5	1	-	1	-	-	-	-	7
	-	746,491	148,108	-	148,108	-	-	-	-	1,042,707
[60-64)	1	8	2	-	-	-	-	-	-	11
	148,108	1,189,563	302,167	-	-	-	-	-	-	1,639,838
[65-69)	-	3	-	-	-	-	-	-	-	3
	-	443,683	-	-	-	-	-	-	-	443,683
[70+	-	1	-	-	-	-	-	-	-	1
	-	103,986	-	-	-	-	-	-	-	103,986
TOTAL	7	72	5	3	1	-	-	-	-	88
	$788,733	10,445,093	746,317	440,654	148,108	-	-	-	-	$12,568,905

AVERAGES	Attained Age	49.97
	Service Years	2.79
	Annual Salary	$142,828

LASERS MEMBERSHIP PROFILE
Hazardous Duty

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)	266	216	1	-	-	-	-	-	-	483
	$5,905,334	6,403,153	33,426	-	-	-	-	-	-	$12,341,913
[25-29)	179	282	18	1	-	-	-	-	-	480
	4,756,397	9,321,590	650,138	41,784	-	-	-	-	-	14,769,909
[30-34)	115	202	39	11	-	-	-	-	-	367
	3,225,143	6,769,786	1,561,965	485,553	-	-	-	-	-	12,042,447
[35-39)	67	154	27	24	13	3	-	-	-	288
	1,760,857	5,279,343	1,134,553	1,227,898	714,458	174,083	-	-	-	10,291,192
[40-44)	41	119	31	17	17	7	-	-	-	232
	1,198,582	4,358,789	1,417,405	867,201	983,428	429,729	-	-	-	9,255,134
[45-49)	51	119	21	18	21	17	5	-	-	252
	1,448,083	4,335,598	874,396	918,349	1,080,000	915,471	392,320	-	-	9,964,217
[50-54)	24	101	19	8	14	7	2	-	-	175
	832,777	3,825,467	772,731	395,765	608,958	373,703	217,170	-	-	7,026,571
[55-59)	26	57	12	3	11	5	4	-	-	118
	824,058	2,135,729	563,010	173,704	462,582	247,916	241,082	-	-	4,648,081
[60-64)	8	20	1	3	1	-	1	-	-	34
	194,964	824,845	32,051	164,526	77,120	-	46,058	-	-	1,339,564
[65-69)	3	5	1	-	1	-	-	-	-	10
	89,430	171,087	31,990	-	41,559	-	-	-	-	334,066
[70+	-	1	-	-	-	-	-	-	-	1
	-	67,605	-	-	-	-	-	-	-	67,605
TOTAL	780	1276	170	85	78	39	12	-	-	2,440
	$20,235,626	43,492,992	7,071,665	4,274,780	3,968,105	2,140,902	896,630	-	-	$82,080,699

AVERAGES	Attained Age	35.83
	Service Years	3.44
	Annual Salary	$33,640

LASERS MEMBERSHIP PROFILE
Corrections Primary

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)	-	1	-	1	6	-	-	-	-	8
	-	29,240	-	38,709	309,666	-	-	-	-	377,615
[40-44)	-	-	-	2	19	5	1	-	-	27
	-	-	-	85,931	943,101	265,893	75,712	-	-	1,370,637
[45-49)	-	-	-	-	21	12	-	-	-	33
	-	-	-	-	1,030,453	687,764	-	-	-	1,718,217
[50-54)	-	-	-	2	40	12	7	2	-	63
	-	-	-	94,081	2,034,248	647,198	464,934	205,525	-	3,445,986
[55-59)	-	-	-	3	47	12	7	2	-	71
	-	-	-	131,800	2,352,882	685,943	440,809	101,522	-	3,712,956
[60-64)	-	-	-	1	17	8	2	1	-	29
	-	-	-	45,173	790,465	451,399	138,986	54,576	-	1,480,599
[65-69)	-	-	-	-	3	1	1	-	-	5
	-	-	-	-	136,813	50,586	54,576	-	-	241,975
[70+	-	-	-	-	-	1	-	-	-	1
	-	-	-	-	-	54,576	-	-	-	54,576
TOTAL	-	1	-	9	153	51	18	5	-	237
	$ -	29,240	-	395,694	7,597,628	2,843,359	1,175,017	361,623	-	$12,402,561

AVERAGES	Attained Age	53.34
	Service Years	19.35
	Annual Salary	$52,331

LASERS MEMBERSHIP PROFILE
Corrections Secondary

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)	-	-	2	-	-	-	-	-	-	2
	$ -	-	69,390	-	-	-	-	-	-	$69,390
[25-29)	-	6	51	1	-	-	-	-	-	58
	-	172,853	1,865,527	35,516	-	-	-	-	-	2,073,896
[30-34)	2	3	129	84	4	-	-	-	-	222
	33,339	91,694	5,004,648	3,645,525	187,853	-	-	-	-	8,963,059
[35-39)	-	2	90	107	90	7	-	-	-	296
	-	64,280	3,533,590	4,962,532	4,500,681	410,458	-	-	-	13,471,541
[40-44)	-	3	65	86	131	63	9	-	-	357
	-	64,831	2,536,881	4,095,398	7,119,163	3,915,630	675,913	-	-	18,407,816
[45-49)	-	-	58	78	106	130	30	1	-	403
	-	-	2,298,130	3,369,943	5,537,417	8,147,277	2,178,825	79,844	-	21,611,436
[50-54)	-	1	68	65	67	41	34	5	-	281
	-	29,240	2,517,776	2,729,482	3,386,125	2,418,773	2,328,294	423,629	-	13,833,319
[55-59)	-	1	38	50	42	19	9	-	-	159
	-	31,619	1,473,152	2,125,069	2,214,128	1,160,025	605,448	-	-	7,609,441
[60-64)	-	-	31	20	21	5	5	3	2	87
	-	-	1,218,803	849,675	1,143,500	294,049	302,467	195,296	145,164	4,148,954
[65-69)	-	-	8	9	5	3	-	-	-	25
	-	-	294,484	460,979	275,122	152,768	-	-	-	1,183,353
[70+	-	-	3	2	-	-	-	-	-	5
	-	-	106,822	75,258	-	-	-	-	-	182,080
TOTAL	2	16	543	502	466	268	87	9	2	1,895
	$33,339	454,517	20,919,203	22,349,377	24,363,989	16,498,980	6,090,947	698,769	145164	$91,554,285

AVERAGES	Attained Age	45.24
	Service Years	14.44
	Annual Salary	$48,314

LASERS MEMBERSHIP PROFILE
Wildlife

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)	-	-	3	-	-	-	-	-	-	3
	-	-	145,496	-	-	-	-	-	-	145,496
[30-34)	-	-	21	12	-	-	-	-	-	33
	-	-	1,087,318	670,525	-	-	-	-	-	1,757,843
[35-39)	-	-	12	17	9	-	-	-	-	38
	-	-	621,782	1,029,075	622,676	-	-	-	-	2,273,533
[40-44)	-	-	2	10	27	2	-	-	-	41
	-	-	97,667	636,067	1,969,061	150,906	-	-	-	2,853,701
[45-49)	-	-	1	6	8	9	3	-	-	27
	-	-	59,041	353,703	625,987	720,139	238,785	-	-	1,997,655
[50-54)	-	-	2	3	3	5	2	-	-	15
	-	-	120,907	200,468	218,550	406,085	183,869	-	-	1,129,879
[55-59)	-	-	-	-	-	1	1	1	-	3
	-	-	-	-	-	111,266	122,779	127,449	-	361,494
[60-64)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[65-69)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[70+	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
TOTAL	-	-	41	48	47	17	6	1	-	160
	$ -	-	2,132,211	2,889,838	3,436,274	1,388,396	545,433	127,449	-	$10,519,601

AVERAGES	Attained Age	40.93
	Service Years	14.33
	Annual Salary	$65,748

LASERS MEMBERSHIP PROFILE
Peace Officers

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)	-	-	1	3	-	-	-	-	-	4
	-	-	43,595	144,249	-	-	-	-	-	187,844
[35-39)	-	-	3	4	2	-	-	-	-	9
	-	-	132,761	178,809	98,629	-	-	-	-	410,199
[40-44)	-	-	2	3	2	5	-	-	-	12
	-	-	75,264	175,580	117,390	262,434	-	-	-	630,668
[45-49)	-	-	-	3	3	2	5	-	-	13
	-	-	-	135,376	156,091	104,929	334,868	-	-	731,264
[50-54)	-	-	-	1	1	5	4	-	-	11
	-	-	-	49,242	58,210	324,283	268,498	-	-	700,233
[55-59)	-	-	-	2	-	1	1	-	-	4
	-	-	-	112,777	-	71,006	58,790	-	-	242,573
[60-64)	-	-	1	-	1	-	-	-	-	2
	-	-	81,527	-	75,578	-	-	-	-	157,105
[65-69)	-	-	1	1	-	-	-	-	-	2
	-	-	65,749	39,699	-	-	-	-	-	105,448
[70+	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
TOTAL	-	-	8	17	9	13	10	-	-	57
	$ -	-	398,896	835,732	505,898	762,652	662,156	-	-	$3,165,334

AVERAGES	Attained Age	46.86
	Service Years	17.42
	Annual Salary	$55,532

LASERS MEMBERSHIP PROFILE
Harbor Police

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)	-	1	-	-	-	-	-	-	-	1
	$ -	39,279	-	-	-	-	-	-	-	$39,279
[25-29)	-	1	-	-	-	-	-	-	-	1
	-	42,506	-	-	-	-	-	-	-	42,506
[30-34)	1	2	2	-	-	-	-	-	-	4
	66,440	82,296	91,011	-	-	-	-	-	-	173,307
[35-39)	1	-	-	-	3	-	-	-	-	3
	11,423	-	-	-	155,585	-	-	-	-	155,585
[40-44)	-	1	2	3	2	-	-	-	-	8
	-	39,630	88,030	155,334	104,372	-	-	-	-	387,366
[45-49)	-	-	-	1	4	1	1	-	-	7
	-	-	-	51,600	220,603	61,018	77,712	-	-	410,933
[50-54)	1	-	-	-	1	1	2	-	-	4
	21,796	-	-	-	49,232	66,609	135,163	-	-	251,004
[55-59)	-	-	-	-	1	-	1	-	-	2
	-	-	-	-	63,132	-	57,665	-	-	120,797
[60-64)	-	-	-	1	1	-	-	-	-	2
	-	-	-	61,511	52,395	-	-	-	-	113,906
[65-69)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[70+	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
TOTAL	-	5	4	5	12	2	4	-	-	32
	$ -	203,711	179,041	268,445	645,319	127,627	270,540	-	-	$1,694,683

AVERAGES	Attained Age	44.4
	Service Years	14.89
	Annual Salary	$52,959

LASERS MEMBERSHIP PROFILE
DROP Participants

CELLS DEPICT **Member Count**
Total Benefit

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)	-	-	-	-	-	-	-	-	-	-
	$ -	-	-	-	-	-	-	-	-	$ -
[40-44)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[45-49)	16	20	1	-	-	-	-	-	-	37
	$775,980	840696	37332	-	-	-	-	-	-	$1,654,008
[50-54)	75	120	84	1	-	-	-	-	-	280
	$3,268,572	5058684	3412956	86400	-	-	-	-	-	$11,826,612
[55-59)	209	215	191	2	-	-	-	-	-	617
	$8,303,748	7923780	7365456	72792	-	-	-	-	-	$23,665,776
[60-64)	215	235	193	-	-	-	-	-	-	643
	$5,183,448	5213628	5047008	-	-	-	-	-	-	$15,444,084
[65-69)	11	8	9	-	-	-	-	-	-	28
	$92,136	61188	80400	-	-	-	-	-	-	$233,724
[70-74)	1	2	1	-	-	-	-	-	-	4
	$7,452	76788	8496	-	-	-	-	-	-	$92,736
[75-79)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[80-84)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[85-89)	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
[90+	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
TOTAL	527	600	479	3	-	-	-	-	-	1609
	$17,631,336	19,174,764	15,951,648	159,192	-	-	-	-	-	$ 52,916,940

AVERAGES	Attained Age	58.16
	Years Retired	1.48
	Yearly Benefit	$32,888

LASERS MEMBERSHIP PROFILE
After DROP

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

Valuation Date **6/30/2016**

Age/Service	(0-1)	[1-2)	[2-3)	[3-4)	[4-5)	[5-10)	[10-14)	[15+	TOTAL
[0-45)	-	-	-	-	-	-	-	-	-
	$ -	-	-	-	-	-	-	-	$ -
	$ -	-	-	-	-	-	-	-	$ -
[45-49)	1	-	-	1	-	-	-	-	2
	32,480	-	-	65549	-	-	-	-	98,029
	32,268	-	-	36516	-	-	-	-	68,784
[50-54)	43	41	23	11	2	9	5	-	134
	2,309,094	2,617,511	1,541,656	624,125	134,769	738,919	358,809	-	8,324,883
	1,730,592	1,717,968	971,400	378,432	68,280	233,376	88,788	-	5,188,836
[55-59)	105	130	80	58	33	50	7	1	464
	5,652,143	8,745,556	5,132,090	3,649,589	2,192,817	3,254,571	628,247	91,374	29,346,387
	4,082,820	5,544,888	3,228,828	2,233,212	1,238,256	1,537,764	142,824	13,584	18,022,176
[60-64)	101	116	78	66	53	119	25	3	561
	4,483,578	6,953,114	5,017,727	3,874,941	3,577,182	7,535,536	1,807,408	234,898	33,484,384
	2,134,272	3,160,452	2,949,288	2,215,068	1,881,372	3,778,332	624,504	38,244	16,781,532
[65-69)	14	15	48	41	34	129	48	4	333
	651,935	733,219	2,892,091	2,083,338	1,798,769	8,494,904	3,961,959	400,780	21,016,995
	178,296	238,824	1,095,948	772,224	654,444	3,346,176	1,587,660	91,296	7,964,868
[70+	4	4	1	3	5	65	53	21	156
	151,154	149,147	72,059	132,234	268,610	4,025,360	2,984,348	1,427,318	9,210,230
	38,088	32,676	11,352	29,772	55,476	1,168,848	793,848	416,448	2,546,508
TOTAL	268	306	230	180	127	372	138	29	1,650
	$13,280,383	19,198,547	14,655,623	10,429,776	7,972,147	24,049,290	9,740,771	2,154,370	$101,480,907
	$8,196,336	10,694,808	8,256,816	5,665,224	3,897,828	10,064,496	3,237,624	559,572	$50,572,704

AVERAGES		
	Attained Age	62.49
	Service Years	4.26
	Annual Salary	$61,504
	Yearly Benefit	$30,650

LASERS MEMBERSHIP PROFILE
Post Retirement Service

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)	-	1	-	-	-	-	-	-	-	1
	-	31,685	-	-	-	-	-	-	-	31,685
[45-49)	1	4	-	-	-	-	-	-	-	5
	55,000	247,878	-	-	-	-	-	-	-	302,878
[50-54)	6	11	7	-	-	-	-	-	-	24
	210,000	608,941	409,843	-	-	-	-	-	-	1,228,784
[55-59)	7	21	7	5	-	-	-	-	-	40
	268,000	1,126,604	338,087	251,566	-	-	-	-	-	1,984,257
[60-64)	19	12	7	5	2	-	-	-	-	45
	685,000	966,124	447,733	293,323	150,069	-	-	-	-	2,542,249
[65-69)	14	23	5	3	-	-	-	-	-	45
	573,000	1,201,738	327,453	167,499	-	-	-	-	-	2,269,690
[70+	19	19	13	4	1	-	-	-	-	56
	688,000	830,113	519,122	198,836	116,979	-	-	-	-	2,353,050
TOTAL	66	91	39	17	3	-	-	-	-	216
	$2,479,000	5,013,083	2,042,238	911,224	267,048	-	-	-	-	$10,712,593

AVERAGES	Attained Age	64.65
	Service Years	3.65
	Annual Salary	$49,595

LASERS 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)	[10-14)	[15-20)	[20+	TOTAL
[0-40)	1	2	1	-	-	-	-	-	-	4
	$24,576	21,900	8,232	-	-	-	-	-	-	$54,708
[40-44)	8	5	20	19	-	-	-	-	-	52
	262,680	146,496	256,608	236,652	-	-	-	-	-	902,436
[45-49)	37	49	103	140	26	18	5	-	-	378
	1,258,692	1,274,616	2,214,444	2,657,340	679,416	390,936	126,420	-	-	8,601,864
[50-54)	102	127	275	399	220	292	94	20	-	1,529
	3,842,484	4,367,544	7,696,776	11,518,200	7,587,432	8,285,256	1,663,716	398,592	-	45,360,000
[55-59)	180	208	406	690	655	1712	393	188	6	4,438
	6,690,996	7,311,816	13,099,296	24,385,032	26,866,152	58,028,484	8,158,812	2,915,832	116,784	147,573,204
[60-64)	457	489	621	766	631	3014	1698	410	103	8,189
	9,951,432	11,454,456	14,859,444	21,839,820	19,077,456	107,233,200	51,750,972	7,929,156	1,976,832	246,072,768
[65-69)	162	195	224	436	422	3188	3259	1246	216	9,348
	4,319,952	5,018,340	4,985,688	10,190,292	10,122,816	73,179,828	99,545,484	35,546,136	5,120,052	248,028,588
[70-74)	39	57	51	126	115	725	2298	1767	789	5,967
	1,049,016	2,440,524	1,280,232	3,371,592	2,867,988	14,437,536	45,052,236	50,751,204	21,169,944	142,420,272
[75-79)	11	14	16	26	17	200	544	1867	1639	4,334
	279,840	533,064	434,256	699,780	400,188	4,588,500	9,209,916	34,516,476	42,032,280	92,694,300
[80-84)	1	3	3	7	8	61	118	580	2224	3,005
	7,596	113,904	76,404	262,176	229,920	1,682,412	2,274,024	10,709,952	44,049,264	59,405,652
[85-89)	-	-	-	1	1	10	20	137	1644	1,813
	-	-	-	18,792	10,224	261,276	387,696	2,500,704	28,951,308	32,130,000
[90+	-	-	-	-	-	-	4	23	914	941
	-	-	-	-	-	-	120,720	376,632	13,825,440	14,322,792
TOTAL	998	1,149	1,720	2,610	2,095	9,220	8,433	6,238	7,535	39,998
	$27,687,264	32,682,660	44,911,380	75,179,676	67,841,592	268,087,428	218,289,996	145,644,684	157,241,904	$1,037,566,584

AVERAGES		
	Attained Age	69.09
	Years Retired	12.48
	Yearly Benefit	$25,940

LASERS MEMBERSHIP PROFILE
Disability Benefits

CELLS DEPICT **Member Count**
Total Benefits

Valuation Date **6/30/2016**

Age/Years Retired	(0-1)	[1-5)	[5-10)	[10-15)	[15-20)	[20-25)	[25-30)	[30-35)	[35+	TOTAL
[0-40)	2	4	3	1	2	-	-	-	-	12
	$27,096	57,576	38,640	20,652	28,248	-	-	-	-	$172,212
[40-44)	7	2	4	2	4	8	2	-	-	29
	130,512	50,052	53,364	14,208	75,072	106,296	21,948	-	-	451,452
[45-49)	11	6	8	7	12	33	9	-	-	86
	234,972	158,148	143,952	104,364	222,720	545,220	126,240	-	-	1,535,616
[50-54)	11	15	10	33	18	68	41	14	3	213
	161,256	295,440	153,132	673,248	367,596	1,210,512	565,128	148,716	19,032	3,594,060
[55-59)	16	19	22	25	30	112	85	41	23	373
	249,216	254,148	386,460	500,124	539,832	2,076,612	1,333,380	534,732	193,140	6,067,644
[60-64)	1	3	10	24	28	140	142	107	64	519
	10,800	40,368	206,364	621,684	515,976	2,290,344	2,484,324	1,508,112	637,104	8,315,076
[65-69)	-	-	-	-	-	40	141	130	129	440
	-	-	-	-	-	644,100	2,066,388	1,810,956	1,527,360	6,048,804
[70-74)	-	-	-	-	-	-	48	91	175	314
	-	-	-	-	-	-	602,580	1,161,936	1,865,772	3,630,288
[75-79)	-	-	-	-	-	1	-	35	189	225
	-	-	-	-	-	58,092	-	384,936	1,948,404	2,391,432
[80-84)	-	-	-	-	-	-	-	1	119	120
	-	-	-	-	-	-	-	52,608	1,107,012	1,159,620
[85-89)	-	-	-	-	-	-	-	-	46	46
	-	-	-	-	-	-	-	-	448,944	448,944
[90+	-	-	-	-	-	-	-	-	24	24
	-	-	-	-	-	-	-	-	222,624	222,624
TOTAL	48	49	57	92	94	402	468	419	772	2,401
	$813,852	855,732	981,912	1,934,280	1,749,444	6,931,176	7,199,988	5,601,996	7,969,392	$34,037,772

AVERAGES	Attained Age	65.40
	Years Retired	15.75
	Yearly Benefit	$14,176

LASERS 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)	10	13	10	14	22	91	118	97	122	497
	$282,108	404,148	221,724	420,588	551,988	2,489,940	2,302,836	1,704,348	1,667,220	$10,044,900
[40-44)	-	2	-	2	1	14	19	10	43	91
	-	33,072	-	74,736	19,788	294,864	248,868	138,312	598,752	1,408,392
[45-49)	1	2	5	-	2	15	10	12	31	78
	71,076	45,240	84,540	-	60,048	217,188	123,600	244,836	403,752	1,250,280
[50-54)	1	-	9	4	6	27	25	24	21	117
	67,560	-	255,276	66,048	101,472	504,660	458,748	279,888	300,384	2,034,036
[55-59)	1	7	4	12	4	58	49	41	53	229
	25,992	158,964	124,248	354,888	113,916	1,256,796	747,444	615,600	654,732	4,052,580
[60-64)	4	9	13	13	13	84	120	76	96	428
	75,804	186,300	253,608	386,628	195,120	2,034,288	2,526,372	1,357,056	1,486,992	8,502,168
[65-69)	5	4	4	6	13	92	170	136	188	618
	169,656	137,052	42,060	137,868	255,384	1,813,224	3,620,664	2,932,596	2,863,416	11,971,920
[70-74)	1	1	1	-	2	47	121	185	411	769
	27,168	23,616	19,752	-	50,388	1,067,940	2,321,100	3,445,920	6,382,224	13,338,108
[75-79)	1	-	1	-	2	21	54	161	656	896
	58,164	-	23,172	-	64,380	372,180	1,012,176	2,432,376	9,747,696	13,710,144
[80-84)	-	-	1	-	1	4	13	85	786	890
	-	-	19,908	-	25,788	65,004	175,176	1,143,012	10,641,492	12,070,380
[85-89)	-	-	1	-	-	2	7	22	682	714
	-	-	17,292	-	-	42,324	122,664	312,708	8,691,396	9,186,384
90+	-	-	-	-	-	-	-	3	472	475
	-	-	-	-	-	-	-	68,520	5,699,532	5,768,052
TOTAL	24	38	49	51	66	455	706	852	3,561	5,802
	$777,528	988,392	1,061,580	1,440,756	1,438,272	10,158,408	13,659,648	14,675,172	49,137,588	$93,337,344

AVERAGES	Attained Age	71.46
	Years Retired	22.71
	Yearly Benefit	$16,087

LASERS MEMBERSHIP PROFILE
Terminated Vested

CELLS DEPICT **Member Count**
Total Benefits

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)	-	-	28	-	-	-	-	-	-	28
	-	-	129,984	-	-	-	-	-	-	129,984
[30-34)	-	3	216	25	-	-	-	-	-	244
	-	5,088	1,399,042	312,876	-	-	-	-	-	1,717,006
[35-39)	1	2	142	191	15	-	-	-	-	351
	216	5,220	1,002,857	2,749,026	259,368	-	-	-	-	4,016,687
[40-44)	-	2	135	306	96	7	1	-	-	547
	-	8,640	1,018,549	5,079,268	2,050,845	204,408	63,744	-	-	8,425,455
[45-49)	1	3	109	362	163	35	7	-	-	680
	360	14,124	813,198	5,604,491	3,810,415	1,076,341	227,568	-	-	11,546,497
[50-54)	-	2	83	375	217	52	28	-	-	757
	-	7,644	641,512	5,886,223	4,673,964	1,442,512	1,142,576	-	-	13,794,431
[55-59)	1	4	116	486	264	70	6	-	-	947
	1,080	30,144	852,948	6,724,651	5,286,275	1,783,803	278,364	-	-	14,957,265
[60-64)	-	1	35	106	55	10	5	1	-	213
	-	1980	285,581	1,245,477	858,510	170,964	136,788	72600	-	2,771,900
[65-69)	-	1	2	35	8	4	1	-	-	51
	-	14,916	32,244	295,056	125,172	82,344	45,480	-	-	595,212
[70+	-	-	2	26	10	3	3	3	-	47
	-	-	2,748	94,980	63,912	31,104	10,404	82,464	-	285,612
TOTAL	3	18	868	1,912	828	181	51	4	-	3,865
	$1,656	87,756	6,178,664	27,992,048	17,128,461	4,791,476	1,904,924	155,064	-	$58,240,049

AVERAGES	Attained Age	50.31
	Service Years	12.57
	Yearly Benefit	$15,069

3. Plan Provisions

EFFECTIVE DATE:

July 1, 1947

EMPLOYEE:

Any person who legally occupies a position in state service.

EMPLOYER:

The State of Louisiana or any of its boards, commissions, departments, agencies and courts which are contributing members and those approved for membership by the legislature from which any employee receives his compensation.

ELIGIBILITY FOR PARTICIPATION:

Condition of employment in state service except the following: elected or appointed officials or employees who are contributing members of any other state system; public officials and state employees who receive a per diem in lieu of compensation; persons employed prior to January 1, 1973, who work on a part-time basis and elect not to participate; patient or inmate help in state charitable, penal or correctional institutions; part-time students, interns and resident physicians; independent contractors; employees who are age 60 or older at time of employment; retirees of the retirement system who return to work under certain conditions; judges who failed to elect membership prior to October 2, 1976; civilian employees who on November 1, 1981, were within five years of retirement eligibility in the Federal Civil Service Retirement and Disability Fund; teachers employed after September 10, 1982; nurses employed from employment pools at state charity hospitals; temporary, seasonal, part-time employees of DOTC, or as defined in federal law.

SERVICE:

Service as an "Employee," defined above.

CREDITABLE SERVICE:

For service prior to January 1, 1973: 1/4 year granted for each 89 day interval of service, not to exceed one credit per fiscal year. Minimum 15 days required for 1st Quarter credit.

For service on or after January 1, 1973, a member shall receive credit based on the ratio of actual pay to the annual base per calendar year. Fractional service shall be rounded to the next highest 1/10th, not to exceed 100 percent per year.

ADDITIONAL CREDITABLE SERVICE:

1. Credit for service canceled by withdrawal of accumulated contributions may be restored by member by paying into system the amount withdrawn plus interest at the Actuarial Valuation rate.

2. Maximum of four years of credit for military service may be obtained for each member with at least two years of service, contingent on payment of Actuarial Cost.

3. Credit for service which was classified as a job appointment or emergency appointment where the intended duration of employment exceeds two years of service.

4. At retirement, all accumulated unused sick and annual leave shall be credited based on the following schedule:

1 - 26 Days	10% of a Year
27 - 52 Days	20% of a Year
53 - 78 Days	30% of a Year
79 - 104 Days	40% of a Year
105 - 130 Days	50% of a Year
131 - 156 Days	60% of a Year
157 - 182 Days	70% of a Year
183 - 208 Days	80% of a Year
209 - 234 Days	90% of a Year
235 - 260 Days	100% of a Year

Service credit for unused leave can be used for computation purpose only, not for eligibility. An actuarial equivalent lump sum is available after August 15, 1993.

EARNABLE COMPENSATION:

The base pay earned by an employee for a given pay period as reported by the employing agency. This includes the full amount earned by an employee, overtime, and per diem earned by an employee of the House of Representatives, the Senate, or an agency of the legislature, and expense allowances and per diem paid to members of the legislature, the clerk, or sergeant at arms of the House of Representatives and president and secretary or sergeant at arms of the Senate.

AVERAGE FINAL COMPENSATION FOR BENEFIT PURPOSES:

The average annual earned compensation for the 36 highest months of successive employment, or the highest 36 successive joined months where interruption of service occurred; part-time employees use the base pay the part-time employee would have received had employment been full-time. Per Act 75 of 2005, average final

compensation for Regular members, Bridge Police, and Appellate Law Clerks hired on or after July, 1, 2006, is determined as the 60 highest months of successive employment. Per Act 992 of 2010, average final compensation for Judges hired on or after January 1, 2011, and all members of the Hazardous Duty Plan is based on the highest 60 months. Compensation is limited by the 401(a)(17) compensation limit of the Internal Revenue Code for certain members.

ACCUMULATED CONTRIBUTIONS:

The sum of all amounts deducted from the earned compensation of a member and credited to the individual account in the employee's savings account, together with regular interest credited prior to July 1971.

EMPLOYEE CONTRIBUTIONS:

Sub Plan	Contribution Rate
Rank & File Employees and Appellate Law Clerks	7.5%
Pre Act 75 (Hired before 7/1/2006)	8.0%
Post Act 75 (Hired after 6/30/2006)	11.5%
Pre 2011 Judges and Court Officers	13.0%
Post 2011 Judges	11.5%
Legislators	9.5%
Special Legislative	

Sub Plan	Contribution Rate
Correction-Primary	9.0%
Corrections-Secondary	9.0%
Wildlife Officers	9.5%
Peace Officers	9.0%
ATC Officers	9.0%
Bridge Police	8.5%
Hazardous Duty	9.5%

EMPLOYER CONTRIBUTIONS:

Act 81 of 1988 requires the employer's rate to be actuarially determined and set annually, based on the Public Retirement Systems' Actuarial Committee's recommendation to the Legislature. Act 1026 of the 2010 Legislative Session further requires that the employer contribution rate be determined separately by sub plan. The normal cost portion of each plan's employer contribution rate varies based upon that plan's benefits, member demographics, and the rate contributed by employees. The shared UAL contribution rate is determined in aggregate for all plans. The UAL established due to a specific plan or group of plans due to legislation will be allocated entirely to the applicable plan(s).

RETIREMENT BENEFIT:

NORMAL RETIREMENT:

Eligibility and Benefit:

Members whose first employment which makes them eligible for membership in a Louisiana state retirement system occurs on or after July 1, 2015:

1. Regular Plan: Eligible with 5 years at age 62. Benefit accrual rate is 2.5%.

2. Judges: Eligible with 5 years at age 62. Benefit accrual is 3.5%, plus regular plan benefits for prior service.

3. Hazardous Duty Plan: Eligible with 12 years at age 55 or 25 years at any age. Benefit accrual rate is 3.33% for service earned in the Hazardous Duty Plan if the last 10 years of service was earned in a hazardous duty position; otherwise, the accrual rate is 2.5%.

Members whose first employment which makes them eligible for membership in a Louisiana state retirement system occurs between January 1, 2011, and June 30, 2015:

1. Regular Plan: Eligible with 5 years at age 60. Benefit accrual rate is 2.5%.

2. Judges: Eligible with 5 years at age 60. Benefit accrual is 3.5%, plus regular plan benefits for prior service.

3. Hazardous Duty Plan: Eligible with 12 years at age 55 or 25 years at any age. Benefit accrual rate is 3.33% for service earned in the Hazardous Duty Plan if the last 10 years of service was earned in a hazardous duty position; otherwise, the accrual rate is 2.5%.

Members whose first employment which makes them eligible for membership in a Louisiana state retirement system occurs prior to January 1, 2011:

1. Regular members hired prior to July 1, 2006: Eligible with 10 years at age 60, or 25 years at age 55, or 30 years at any age. Regular members hired on or after July 1, 2006, are eligible with 5 years at age 60. Benefit accrual rate is 2.5% for all years of service.

2. Judges, Court Officers, and Appellate Law Clerks: Eligible with 18 years at any age, 10 years at age 65, 20 total years with at least 12 years as a judge or court officer at age 50, 12 years at age 55, or age 70 regardless of service. Judges and Court Officers earn 3.5% per year of service, plus regular plan benefits for prior service. Appellate Law Clerks earn 2.5% for all years of service.

3. Members of the legislature, governor, lieutenant governor and state treasurer: Eligible with 16 years of service at any age, 20 total years with at least 12 years as a member

of this class at age 50, or 12 years at age 55. Members earn 3.5% per year of service, plus regular plan benefits for prior service.

4. Plans for certain employees of the Department of Public Safety and Corrections:
   a. Corrections Primary hired before 8/15/1986: Eligible with 10 years at age 60 or 20 years at any age. Benefit accrual rate is 2.5%.
   b. Corrections Primary hired between 8/15/1986 and 12/31/2001: Eligible with 10 years at age 60 or 20 years at age 50. Benefit accrual rate is 2.5%.
   c. Corrections Primary hired prior to 12/31/2001 and employed as a probation and parole officers in the office of adult services of the Department of Corrections: Eligibility is as stated above. Benefit accrual rate is 3.0% for service earned prior to 7/1/2014 and 3.33% for service earned after 6/30/2014.
   d. Corrections Secondary Plan hired after 1/1/2002 or transferred from Corrections Primary Plan: Eligible with 10 years at age 60 or 25 years at any age. Benefit accrual rate is 3.33%.

5. Wildlife and Fisheries:
   a. Members hired before July 1, 2003: 10 years at age 55 or 20 years at any age. Benefit accrual is 3.0% for service earned prior to July 1, 2003 and 3.33% for service earned after July 1, 2003.
   b. Members hired on or after July 1, 2003: 10 years at age 60 or 25 years at any age. Benefit accrual is 3.33%.

6. Peace Officers: Eligible with 10 years of service at age 60, 25 years at age 55, or 30 years at any age. Benefit accrual is 3.33%.

7. Alcohol Tobacco Control: Eligible with 10 years of service at age 60 or 25 years of service at any age. Benefit accrual is 3.33%.

8. Bridge Police: Eligible with 10 years at age 60 or 25 years at any age. Benefit accrual is 2.5%

NOTES:

A. Benefit is limited to 100% of average compensation.

B. Retirees who return to work will continue to receive unreduced benefits if compensation does not exceed 50% of the annual benefit during the fiscal year. Earnings above this limit will result in a corresponding reduction to benefits. Retirees who return to work may choose to suspend their retirement benefits and resume making contributions in the system. Upon subsequent retirement, benefits will resume. If post-retirement employment is at least 36 months, a supplemental benefit will be calculated based on current final average salary. Otherwise, a supplemental benefit will be calculated based on the frozen final average salary at the original retirement date.

C. A $300 annual supplemental benefit is provided to persons who become members of the retirement system prior to July 1, 1986 (Act 608 of 1986).

D. For members employed after January 1, 1990, the annual pension paid from the trust cannot exceed the maximum benefit provided under Section 415(b) of the Internal Revenue Service Code, and related Section 415 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	$62,674	56	$122,937	64	$210,000
49	68,035	57	134,139	65	210,000
50	73,895	58	146,473	66	210,000
51	80,309	59	160,071	67	210,000
52	87,329	60	175,083	68	210,000
53	95,025	61	191,670	69	210,000
54	103,469	62	210,000	70	210,000
55	112,745	63	210,000		

ACTUARIALLY REDUCED RETIREMENT:

Members with 20 years of service credit at any age are eligible for an actuarially reduced benefit from the earliest date the member would have been eligible if employment had continued to the earliest normal retirement date, based on service earned to date. This does not apply to the correctional secondary plan members or wildlife agents hired on or after July 1, 2003.

POST RETIREMENT INCREASES:

Provisions pertaining to cost-of-living adjustments are summarized in Section II(2).

MINIMUM BENEFITS:

Effective September 1, 2001, retirees and beneficiaries receiving retirement benefits shall be entitled to a minimum benefit which is not less than $30.00 per month for each year of creditable service. The minimum benefit is adjusted for the option elected at retirement.

DISABILITY RETIREMENT:

Eligibility:

Ten years of creditable service and certification of disability by medical board. (Medical examination may be required once per year for the first five years of disability retirement, and once every three years thereafter, until age 60.)

Benefit*:

(1) The disability retirement annuity shall be equivalent to the regular retirement formula without reduction by reason of age for all classes of membership.

(2) For judges and court officers, the benefit in (1) above, but not less than 50% of current salary.

(3) Members of the Corrections Primary Plan with disabilities incurred in the line of duty may retire with 60% of their final average compensation, regardless of years of service. Disabilities not incurred in the line of duty shall receive benefits according to (1) above.

(4) Members of the Corrections Secondary Plan with disabilities incurred in the line of duty may retire with 40% of their final average compensation regardless of service. If the member has 10 or more years of service, the benefit will be the greater of 40% of final average compensation or the benefit determined by (1) above. Disabilities not incurred in the line of duty shall receive benefits according to (1) above.

(5) For certain Wildlife agents, partial disabilities not eligible for (1) above receive 75% of the benefit in (1); members totally disabled while in the line of duty receive 60% of average compensation.

(6) Members of the Hazardous Duty Plan with disabilities incurred in the line of duty may retire with 75% of their final average compensation, regardless of years of service. Disabilities not incurred in the line of duty shall receive benefits according to (1) above.

* Because of a lack of enough data to differentiate disability for in-line of duty versus not-in-line of duty, disability benefits for certain sub-plans are valued as a retirement benefit in (1). This assumption has no material impact on liabilities.

SURVIVOR'S BENEFITS:

Members whose first employment, making them eligible for membership in a Louisiana state retirement system, occurs on or after January 1, 2011, or members of the Hazardous Duty Plan regardless of when hired:

Eligibility and Benefit:

1. Regular Members and Judges
   a. Surviving spouse with minor children of a deceased member with five years of service credit, two of which were earned immediately prior to death, or 20 years of service will receive 50% of the retirement benefit that would have been due the member, or $600 per month if greater. Each qualifying child will receive 50% of

the spouses benefit, up to two children. The total paid to the spouse and children subject to a minimum based on the Option 2A equivalent for the surviving spouse.

b. Surviving spouse, legally married one year prior to death, of a deceased member with 10 years of service credit, two of which were earned immediately prior to death, or 20 years of service regardless of date earned will receive the Option 2A equivalent of the retirement benefit that would have been due the member, or $600 per month if greater.

c. Surviving minor children will each (up to two) receive 50% of the benefit paid to a surviving spouse with children. This amount will be divided equally among all eligible children.

d. Surviving handicapped or mentally retarded children continue to receive a minor child's benefit described above in (1) or (3) whichever is applicable.

2. Hazardous duty members:
   a. Surviving spouse and children of members who did not die in the line of duty receive benefits described for non-Hazardous Duty members.
   b. Surviving spouse and children of members who died in the line of duty receive 80% of the member's final average compensation. The benefit is shared equally.
   c. Surviving spouse of a retired member will receive 75% of members' monthly benefit. If no spouse, then surviving children receive 1.c. above.

3. If no one is eligible to receive a survivor benefit, then the named beneficiary will receive the member's accumulated contributions.

Members whose first employment which makes them eligible for membership in a Louisiana state retirement system occurs prior to January 1, 2011:

Eligibility and Benefit:

1. Regular members:
   a. Surviving spouse, legally married one year prior to death, of a deceased member with 10 years of service credit, two of which were earned immediately prior to death, or 20 years of service regardless of date earned, receive the greater of 50% of member's average compensation or $200 per month.
   b. If member with no spouse has surviving minor children and 5 years of service credit, two of which were earned immediately prior to death, or 20 years of service regardless of date earned, minor children shall receive the greater of 75% of member's average compensation or $300 per month.
   c. For surviving spouse with minor children, the spouse must be eligible per (a) above and the children per (b) above to receive these benefits. If either one is ineligible, then the criteria in (a) or (b) would apply accordingly.
   d. Surviving handicapped or mentally retarded children continue to receive a minor child's benefit described above in (1a) or (1c) whichever is applicable.

2. Surviving spouse of a judge or court officer receive survivor's benefit described in (1a) or (1b), but not less than the greater of 1/3 the member's current compensation, 50% of the retirement pay which such member was entitled or receiving prior to

death, or 50% of the member's final average compensation (if the provisions of R.S. 11:471 are met). Benefit limited to 75% of average compensation.

3. Corrections
   a. In the line of duty:
      i. Surviving spouse with no minor children: 60% of average compensation if member had less than 25 years of service, or 75% of average compensation if member had 25 or more years of service.
      ii. Minor children or disabled children and no spouse: 60% of average compensation if member had less than 5 years of service (25 years for Secondary Plan), or 75% of average compensation if member had 5 or more years of service (25 years for Secondary Plan).
      iii. Surviving spouse with minor children: 60% of average compensation if member had less than 5 years of service (25 years for secondary plan) and benefit divided 1/3 to spouse and 2/3 to minor children equally. 75% of average compensation if member had 5 or more years of service (25 years for Secondary Plan) and benefit divided 1/3 to spouse and 2/3 to minor children equally.
   b. Not in the line of duty surviving spouse receives benefits in accordance with the provisions for regular members.

4. Wildlife agents
   a. In line of duty:
      i. Surviving spouse receives 75% of average compensation if member has 25 or more years of service, otherwise, spouse receives 60% of compensation. Benefits cease upon remarriage.
      ii. Children under age 18: one child - 30% of average compensation, 2 children - 40%, 3 children - 50%, 4 or more children - 60%, divided equally among children.
   b. Not in the line of duty benefit to surviving spouse and children: Surviving spouse receives a benefit as if the member retired on the date of death, until remarried. If a member dies prior to age 55 with at least 15 years of service, benefit computed based on years of service without regard to age.
   c. Survivors of retired wildlife agents will receive 75% of the retiree benefit in priority order: surviving spouse (until remarriage), children under age 18, parents who derive main support from retired agent.

5. If no one is eligible to receive a survivor benefit, then the named beneficiary will receive the 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 2 100% of reduced retirement allowance, if member dies, to be continued to

designated beneficiary for his lifetime.

Option 3 50% 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.

A. 90% of the maximum retirement allowance to member; when member dies, 55% of the maximum retirement allowance continued to beneficiary.

B. Reduced retirement allowance to member; if member dies, 55% of the maximum retirement allowance continues to beneficiary, adjusted based on the age and relationship of the beneficiary to the member.

C. Special reversionary annuities to Options 2, 3, and 4. Member's reduced benefit reverts to the maximum if the beneficiary predeceases the annuitant.

If divorced after retirement, optional benefit can revert to maximum benefit with actuarial adjustment.

Automatic COLA Option – An increasing annuity option permits the member to make an irrevocable election at retirement to receive an actuarially reduced benefit which increases 2.5% annually. The increases begin 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.

Initial Benefit Option – Maximum benefit actuarially reduced for partial lump sum equal to not more than 36 months of maximum monthly pension.

REFUND OF CONTRIBUTIONS:

If a member ceases to be a member, except by death or retirement, he shall be paid such part of the amount of the accumulated contributions credited to his individual account in annuity savings fund as he shall demand, plus any accumulated interest thereon as of June 30, 1971; if member of legislature, no interest. No interest credited after June 30, 1971. 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.

DEFERRED RETIREMENT OPTION PLAN:

Instead of terminating employment and accepting a service retirement allowance, any member who has met the normal eligibility requirements may participate in the Deferred Retirement Option Plan (DROP).
Normal Eligibility:

Any member who is eligible for unreduced service retirement allowance may begin participation on the first retirement eligibility date for a period not to exceed the third anniversary of retirement eligibility.

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, then:

(1) Payment into account shall cease;
(2) Payment from account only upon termination of employment; and
(3) The participant shall resume active contributing membership.

Then, upon termination of employment, the benefit payments indicated above shall be paid. The participant shall receive an additional retirement benefit based on additional service rendered since termination of participation in the fund, usually the normal method of computation of benefit subject to the following:

(1) If additional service was less than the period used to determine the average compensation, then the average compensation figure used to calculate the additional benefit shall be based on compensation used to determine the initial benefit.
(2) If additional service was greater than the period used to determine the average compensation, the average compensation figure used to calculate the additional benefit shall be based on compensation earned during the period of additional service.

DROP accounts for members who become eligible for retirement prior to January 1, 2004, and participate in DROP shall earn interest, following termination of DROP, at a rate of 0.5% below the actuarial rate of the System's investment portfolio.

Members eligible for retirement on or after January 1, 2004, must invest their DROP accounts in self-directed accounts approved by the Board of Trustees.

4. Funding Policies

LASERS' funding policy is generally described in Sections 102 and 102.1 of Title 11 of Louisiana Revised Statutes. LASERS 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 2016 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 contributions 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 rate for FYE 2018. It is equal to the projected employer contribution rate multiplied by the projected active member payroll.

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 LASERS is equal to 10.9% and 11.7% depending on whether the employee was hired on or before June 30, 2006, or on or after July 1, 2006, 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. The 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 in 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. Increases 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. Contributions 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 OAB 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 OAB 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 ($50 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 ($50 million) and the second hurdle ($100 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 not be transferred to the Experience Account, but rather 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. Increases in the unfunded accrued liability resulting from investment gains being transferred from the regular pool of assets to the Experience Account are to be amortized over a 30-year period. Such increases are to be amortized over a 10-year period beginning with the June 30, 2016 valuation.

   This creates a need for remedial legislation because the gain sharing/COLA program is being accounted for twice. It is first accounted for by the 40 basis point automatic COLA assumption. It is also accounted for through this amortization requirement. One or the other method is needed, not both. We believe that the former method is superior. This issue did not affect the June 30, 2016 valuation because no funds were transferred to the Experience Account on June 30, 2016.

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 year. 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, LASERS 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 OAB.

3. Investment gains falling between $0 and $50 million reduce the outstanding balance of the OAB.

4. Investment gains falling between $50 million and $100 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 LASERS, as specified in Louisiana law, is summarized below:

1. The LASERS' actuary prepares an actuarial valuation which is presented to the LASERS 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.

4. 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 values were generally within 0.064% of values produced by Foster & Foster. Normal costs were within 0.364%. 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 we could not precisely match results produced by Foster & Foster, normal cost values in our valuation for FYE 2018 were calculated according to the following formula.

Value = A x B / C, where

A = The value produced by Foster & Foster for FYE 2017 using the current set of assumptions.

B = The value produced by the LLA for FYE 2017 using the revised set of assumptions, and

C = The value produced by the LLA for FYE 2017 using the current set of assumptions.

6. Actuarial Assumptions

LASERS typically conducts an experience study every five years, but the scope of such a study is not necessarily limited to a 5-year period. However, the observation period for the most recent experience study in general was 2009-2013. Rates used in this valuation are provided separately for Regular Members, Corrections, Wildlife and Fisheries, and Judges. Actuarial assumptions used in the June 30, 2016 valuation are summarized in this section of the report.

Economic Assumptions

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 8.15%. The assumed rate of return used to prepare projected employer contribution requirements for FYE 2018 is 7.25%. These rates are net of investment expenses. The 7.25% rate is based on studies prepared for the LLA by Gabriel, Roeder, Smith & Company Holdings, LLC (GRS). 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 LASERS' 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 LASERS, and reports prepared for the LLA by GRS 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 LASERS' 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 assumed to be equivalent to a 15-basis point reduction to the assumed long-term rate of return on the actuarial value of assets. Effective FYE 2018, it will be assumed that administrative expense will be directly recognized in the normal cost in accordance with Actuarial Standards of Practice. Please refer to Appendix D – *Basis for the Treatment of Administrative Expenses* for further details.

Administrative costs for FYE 2018 have been estimated to be equivalent to 0.92% of the active member payroll. Legal staff for LASERS has concluded that Louisiana law will not permit direct recognition of administrative expenses in the normal cost. Administrative expenses have been accounted for in this valuation by directly recognizing them in the normal cost in accordance with Actuarial Standards of Practice.

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 (8.15%) minus the cost of the gain sharing/COLA program (25 basis points as determined by the LASERS actuary) minus the cost of administrative expenses (15 basis points as determined by the LASERS actuary). The discount rate used in the preparation of projected employer contributions for FYE 2018 will be 7.25%. 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 3.00% in the preparation of employer contribution requirements for FYE 2017. The inflation component used to determine employer contribution requirements for FYE 2018 will be 2.25%. Please refer to Appendix C – *Basis for Economic Assumptions* for further details regarding the basis for the selection of the rate of inflation for FYE 2018.

The basis for the selection of the rate of inflation for FYE 2018 is summarized below:

1. Studies for the LLA prepared by Gabriel, Roeder, Smith & Company Holdings, LLC.

2. Comparisons with other Louisiana retirement systems, with particular emphasis on the Teachers' Retirement System of Louisiana.

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 2015 using Scale AA. No mortality improvement is assumed to occur after FYE 2015. This table appears to match recent experience for retirement system members. This table was recommended by the system actuary and was approved by the LASERS'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 LASERS-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 2013 experience study.

Termination Assumption

Voluntary termination or withdrawal rates are based on the 2013 Experience Study. Rates for Regular members and Corrections/Hazardous Duty members are based on a combination of age and service. Rates for Judges and Wildlife 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 a 2.50% inflation component for FYE 2017 and a 2.25% rate for FYE 2018, which is consistent with the inflation assumptions used to develop the discount rate. 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 Youngest 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 Members	3.50%	1.50%
Judicial Members	1.00%	1.00%
Corrections	5.00%	3.00%
Wildlife	6.00%	3.00%

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 8.15%. This rate is based in part on capital market assumptions developed by LASERS' internal professional investment staff relying substantially, but not completely, on information provided by NEPC, LASERS 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 7.25%. This rate is based on capital market assumptions for the following eight major investment consulting firms. Once again, the capital market assumptions are considered to be confidential and are not disclosed.

BNY Mellon	NEPC
Hewitt Ennis Knupp	Pension Consulting Alliance
J. P. Morgan	R. V. Kuhns & Associates
Mercer	Towers Watson

RP-2000 MORTALITY TABLE WITH PROJECTION TO 2015 WITH SCALE AA FOR ALL SUB PLANS

	Mortality Rate			Mortality Rate			Mortality Rate	
Age	Male	Female	Age	Male	Female	Age	Male	Female
18	0.000237	0.000152	53	0.002154	0.001841	88	0.139683	0.101042
19	0.000248	0.000151	54	0.002360	0.002085	89	0.154366	0.113903
20	0.000259	0.000150	55	0.002718	0.002409	90	0.172706	0.125879
21	0.000272	0.000148	56	0.003198	0.002823	91	0.188113	0.138232
22	0.000283	0.000150	57	0.003629	0.003226	92	0.207060	0.150672
23	0.000297	0.000155	58	0.004140	0.003639	93	0.223365	0.165391
24	0.000309	0.000160	59	0.004667	0.004119	94	0.239646	0.177391
25	0.000323	0.000168	60	0.005297	0.004689	95	0.259578	0.188755
26	0.000345	0.000179	61	0.006119	0.005393	96	0.275506	0.199303
27	0.000354	0.000186	62	0.006981	0.006175	97	0.290981	0.212034
28	0.000365	0.000196	63	0.008104	0.007094	98	0.310600	0.220611
29	0.000382	0.000207	64	0.009130	0.007995	99	0.325288	0.227940
30	0.000412	0.000227	65	0.010309	0.009003	100	0.339424	0.233930
31	0.000463	0.000272	66	0.011841	0.010161	101	0.358628	0.244834
32	0.000521	0.000310	67	0.013210	0.011282	102	0.371685	0.254498
33	0.000585	0.000344	68	0.014464	0.012471	103	0.383040	0.266044
34	0.000651	0.000374	69	0.016027	0.013784	104	0.392003	0.279055
35	0.000717	0.000402	70	0.017702	0.015529	105	0.397886	0.293116
36	0.000780	0.000429	71	0.019586	0.016975	106	0.400000	0.307811
37	0.000839	0.000455	72	0.021747	0.018881	107	0.400000	0.322725
38	0.000881	0.000484	73	0.024223	0.020673	108	0.400000	0.337441
39	0.000919	0.000517	74	0.027024	0.022912	109	0.400000	0.351544
40	0.000957	0.000563	75	0.030622	0.024916	110	0.400000	0.364617
41	0.000997	0.000617	76	0.034131	0.027451	111	0.400000	0.376246
42	0.001045	0.000679	77	0.038547	0.030694	112	0.400000	0.386015
43	0.001100	0.000747	78	0.043489	0.033835	113	0.400000	0.393507
44	0.001166	0.000820	79	0.049071	0.037355	114	0.400000	0.398308
45	0.001239	0.000882	80	0.055360	0.041291	115	0.400000	0.400000
46	0.001308	0.000946	81	0.062905	0.045702	116	0.400000	0.400000
47	0.001382	0.001010	82	0.071350	0.050664	117	0.400000	0.400000
48	0.001460	0.001092	83	0.079534	0.056255	118	0.400000	0.400000
49	0.001543	0.001180	84	0.089800	0.062565	119	0.400000	0.400000
50	0.001628	0.001296	85	0.099680	0.070761	120	1.000000	1.000000
51	0.001837	0.001454	86	0.110516	0.080120			
52	0.001970	0.001633	87	0.124300	0.090716			

RP-2014 MORTALITY TABLE (158% MALE/136% FEMALE)
PROJECTED GENERATIONALLY WITH SCALE MP-2016 (No Projection in Table)

	Mortality Rate			Mortality Rate			Mortality Rate	
Age	Male	Female	Age	Male	Female	Age	Male	Female
18	0.000518	0.000214	53	0.004160	0.002249	88	0.171574	0.115913
19	0.000583	0.000220	54	0.004698	0.002501	89	0.191968	0.129966
20	0.000641	0.000220	55	0.005278	0.002772	90	0.214735	0.145691
21	0.000709	0.000220	56	0.005909	0.003066	91	0.239089	0.162852
22	0.000771	0.000220	57	0.006596	0.003388	92	0.264527	0.181287
23	0.000804	0.000226	58	0.007347	0.003747	93	0.290767	0.200899
24	0.000815	0.000230	59	0.008173	0.004149	94	0.317697	0.221641
25	0.000765	0.000235	60	0.009081	0.004606	95	0.345323	0.243486
26	0.000730	0.000243	61	0.010083	0.005125	96	0.373725	0.266428
27	0.000709	0.000254	62	0.011187	0.005714	97	0.402993	0.290448
28	0.000702	0.000267	63	0.012407	0.006382	98	0.433189	0.315508
29	0.000705	0.000280	64	0.013753	0.007135	99	0.464280	0.341527
30	0.000714	0.000296	65	0.015239	0.007986	100	0.496101	0.368367
31	0.000732	0.000314	66	0.016797	0.008995	101	0.528297	0.395814
32	0.000754	0.000332	67	0.018522	0.010128	102	0.560266	0.423564
33	0.000777	0.000351	68	0.020434	0.011401	103	0.591748	0.451384
34	0.000803	0.000370	69	0.022555	0.012829	104	0.622492	0.479036
35	0.000826	0.000389	70	0.024912	0.014434	105	0.652273	0.506291
36	0.000847	0.000408	71	0.027529	0.016234	106	0.680895	0.532930
37	0.000871	0.000432	72	0.030437	0.018251	107	0.708199	0.558755
38	0.000901	0.000461	73	0.033674	0.020511	108	0.734055	0.583592
39	0.000940	0.000496	74	0.037281	0.023042	109	0.758379	0.607300
40	0.000992	0.000539	75	0.041307	0.025882	110	0.781114	0.629763
41	0.001060	0.000589	76	0.045817	0.029074	111	0.790000	0.650901
42	0.001146	0.000649	77	0.050884	0.032676	112	0.790000	0.670666
43	0.001253	0.000719	78	0.056595	0.036757	113	0.790000	0.680000
44	0.001384	0.000801	79	0.063051	0.041396	114	0.790000	0.680000
45	0.001537	0.000894	80	0.070369	0.046688	115	0.790000	0.680000
46	0.001717	0.000997	81	0.078676	0.052745	116	0.790000	0.680000
47	0.001920	0.001110	82	0.087731	0.058815	117	0.790000	0.680000
48	0.002146	0.001232	83	0.097954	0.065695	118	0.790000	0.680000
49	0.002394	0.001361	84	0.109478	0.073484	119	0.790000	0.680000
50	0.002781	0.001570	85	0.122445	0.082285	120	1.000000	1.000000
51	0.003204	0.001785	86	0.137005	0.092209			
52	0.003664	0.002011	87	0.153320	0.103376			

RANK AND FILE SUB PLAN (INCLUDING APPELLATE LAW CLERKS)
ACTUARIAL TABLES AND RATES

	Disability	Termination Rates										Salary
Age	Rates	< 1 Year	1 Year	2-3 Years	4-5 Years	6 Years	7 Years	8 Years	9 Years	>=10 Years	Duration	Merit Scale*
18	0.0000	0.450	0.300	0.220	0.140	0.100	0.080	0.070	0.060	0.050	0	0.0971
19	0.0000	0.450	0.300	0.220	0.140	0.100	0.080	0.070	0.060	0.050	1	0.0485
20	0.0000	0.450	0.300	0.220	0.140	0.100	0.080	0.070	0.060	0.050	2	0.0388
21	0.0000	0.400	0.300	0.220	0.140	0.100	0.080	0.070	0.060	0.050	3	0.0340
22	0.0000	0.350	0.250	0.220	0.140	0.100	0.080	0.070	0.060	0.050	4	0.0291
23	0.0000	0.290	0.250	0.220	0.130	0.100	0.080	0.070	0.060	0.050	5	0.0267
24	0.0000	0.290	0.210	0.210	0.120	0.100	0.080	0.070	0.060	0.050	6	0.0248
25	0.0000	0.290	0.207	0.200	0.118	0.100	0.080	0.070	0.060	0.050	7	0.0233
26	0.0000	0.290	0.204	0.200	0.116	0.100	0.080	0.070	0.060	0.050	8	0.0223
27	0.0000	0.290	0.201	0.190	0.114	0.100	0.080	0.070	0.060	0.050	9	0.0214
28	0.0000	0.290	0.198	0.180	0.112	0.100	0.080	0.070	0.060	0.050	10	0.0204
29	0.0001	0.290	0.195	0.170	0.110	0.100	0.080	0.070	0.060	0.050	11	0.0194
30	0.0001	0.290	0.192	0.170	0.108	0.100	0.080	0.070	0.060	0.050	12	0.0184
31	0.0001	0.290	0.189	0.160	0.106	0.100	0.080	0.070	0.060	0.050	13	0.0175
32	0.0001	0.290	0.186	0.150	0.104	0.100	0.080	0.070	0.060	0.050	14	0.0165
33	0.0001	0.290	0.183	0.130	0.102	0.100	0.080	0.070	0.060	0.050	15	0.0155
34	0.0001	0.290	0.180	0.130	0.100	0.100	0.080	0.070	0.060	0.050	16	0.0146
35	0.0004	0.290	0.177	0.130	0.098	0.100	0.080	0.070	0.060	0.050	17	0.0136
36	0.0004	0.285	0.174	0.130	0.096	0.100	0.080	0.070	0.060	0.050	18	0.0126
37	0.0004	0.280	0.171	0.120	0.094	0.100	0.080	0.070	0.060	0.050	19	0.0117
38	0.0004	0.275	0.168	0.120	0.092	0.100	0.080	0.070	0.060	0.050	20	0.0107
39	0.0004	0.270	0.165	0.120	0.090	0.100	0.080	0.070	0.060	0.050	21	0.0097
40	0.0004	0.265	0.162	0.110	0.088	0.100	0.080	0.070	0.060	0.050	22	0.0097
41	0.0014	0.260	0.159	0.110	0.086	0.100	0.080	0.070	0.060	0.050	23	0.0097
42	0.0014	0.255	0.156	0.110	0.084	0.100	0.080	0.070	0.060	0.050	24	0.0097
43	0.0014	0.250	0.153	0.080	0.082	0.080	0.070	0.060	0.050	0.040	25	0.0097
44	0.0014	0.245	0.150	0.080	0.080	0.080	0.070	0.060	0.050	0.040	26	0.0097
45	0.0022	0.240	0.147	0.080	0.078	0.080	0.070	0.060	0.050	0.040	27	0.0097
46	0.0022	0.235	0.144	0.080	0.076	0.080	0.070	0.060	0.050	0.040	28	0.0097
47	0.0022	0.230	0.141	0.080	0.074	0.080	0.070	0.060	0.050	0.040	29	0.0097
48	0.0028	0.225	0.138	0.080	0.072	0.080	0.070	0.060	0.050	0.040	30	0.0097
49	0.0028	0.220	0.135	0.080	0.070	0.080	0.070	0.060	0.050	0.040	31	0.0097
50	0.0028	0.215	0.132	0.080	0.068	0.080	0.070	0.060	0.050	0.040	32	0.0097
51	0.0028	0.210	0.129	0.080	0.066	0.080	0.070	0.060	0.050	0.040	33	0.0097
52	0.0036	0.205	0.126	0.080	0.064	0.080	0.070	0.060	0.050	0.040	34	0.0097
53	0.0036	0.200	0.123	0.080	0.062	0.080	0.070	0.060	0.050	0.040	35	0.0097
54	0.0036	0.195	0.120	0.080	0.060	0.080	0.070	0.060	0.050	0.040	36	0.0097
55	0.0036	0.190	0.117	0.080	0.058	0.080	0.070	0.060	0.050	0.040	37	0.0097
56	0.0036	0.185	0.114	0.080	0.056	0.080	0.070	0.060	0.050	0.040	38	0.0097
57	0.0048	0.180	0.111	0.080	0.054	0.080	0.070	0.060	0.050	0.040	39	0.0097
58	0.0048	0.175	0.108	0.080	0.052	0.080	0.070	0.060	0.050	0.040	>=40	0.0097
59	0.0040	0.170	0.105	0.080	0.050	0.080	0.070	0.060	0.050	0.040		
>=60	0.0000	0.165	0.102	0.080	0.048	0.080	0.070	0.060	0.050	0.040		

*Salary Scale is (1+ Inflation) x (1+ Salary Merit)

The inflation rate for the Fiscal Year 2017 contributions is 3.0%; however, the inflation rate beginning with the Fiscal Year 2018 contribution will be 2.25%.

RANK AND FILE SUB PLAN (EXCLUDING APPELLATE LAW CLERKS)
ACTUARIAL TABLES AND RATES

*Retirement Rates for Appellate Law Clerks are the same as Judges on the next page

Age	Retirement/DROP Rates*				
	0-9 Years	10-19 Years	20-24 Years	25-29 Years	>=30 Years
<=34	0.000	0.000	0.000	0.000	0.000
35	0.000	0.000	0.020	0.030	0.000
36	0.000	0.000	0.020	0.030	0.000
37	0.000	0.000	0.020	0.030	0.000
38	0.000	0.000	0.020	0.030	0.000
39	0.000	0.000	0.020	0.030	0.000
40	0.000	0.000	0.020	0.030	0.000
41	0.000	0.000	0.020	0.030	0.000
42	0.000	0.000	0.020	0.030	0.000
43	0.000	0.000	0.020	0.030	0.000
44	0.000	0.000	0.020	0.030	0.000
45	0.000	0.000	0.020	0.030	0.030
46	0.000	0.000	0.020	0.030	0.030
47	0.000	0.000	0.020	0.030	0.500
48	0.000	0.000	0.020	0.060	0.500
49	0.000	0.000	0.020	0.070	0.500
50	0.000	0.000	0.030	0.070	0.430
51	0.000	0.000	0.030	0.070	0.400
52	0.000	0.000	0.030	0.080	0.470
53	0.000	0.000	0.030	0.120	0.440
54	0.000	0.000	0.060	0.280	0.470
55	0.000	0.000	0.080	0.550	0.300
56	0.000	0.000	0.080	0.320	0.250
57	0.000	0.000	0.080	0.300	0.220
58	0.000	0.000	0.080	0.280	0.200
59	0.000	0.000	0.250	0.350	0.180
60	0.100	0.330	0.550	0.300	0.240
61	0.250	0.180	0.210	0.180	0.220
62	0.250	0.160	0.200	0.180	0.250
63	0.250	0.160	0.150	0.250	0.250
64	0.250	0.170	0.150	0.180	0.250
65	0.250	0.240	0.250	0.250	0.250
66	0.250	0.160	0.250	0.200	0.300
67	0.250	0.230	0.300	0.180	0.350
68	0.250	0.230	0.100	0.180	0.200
69	0.250	0.230	0.250	0.400	0.200
70	0.750	0.230	0.250	0.350	0.250
71	0.750	0.230	0.250	0.350	0.250
72	0.750	0.230	0.250	0.350	0.250
73	0.750	0.230	0.250	0.350	0.250
74	0.750	0.230	0.250	0.350	0.250
>=75	1.000	1.000	1.000	1.000	1.000

PRE 2011 JUDGES SUB PLAN AND POST 2011 JUDGES SUB PLAN
ACTUARIAL TABLES AND RATES

		Retirement Rates					
	Disability	(Also Applies to Appellate Law Clerks)				Termination	Salary Merit
Age	Rates	0-14 Years	15-19 Years	>=20 Years	Duration	Rates	Scale*
<=45	0.000	0.000	0.000	0.000	0	0.000	0.0243
46	0.000	0.000	0.200	0.000	1	0.030	0.0000
47	0.000	0.000	0.200	0.000	2	0.040	0.0000
48	0.000	0.000	0.200	0.000	3	0.030	0.0000
49	0.000	0.000	0.200	0.050	4	0.020	0.0000
50	0.000	0.000	0.200	0.050	5	0.010	0.0000
51	0.000	0.000	0.100	0.050	6	0.010	0.0000
52	0.000	0.000	0.100	0.050	7	0.010	0.0000
53	0.000	0.000	0.100	0.050	8	0.010	0.0000
54	0.000	0.000	0.200	0.050	9	0.010	0.0000
55	0.000	0.050	0.200	0.100	10	0.010	0.0000
56	0.000	0.050	0.100	0.060	11	0.010	0.0000
57	0.000	0.100	0.020	0.060	12+	0.010	0.0000
58	0.000	0.050	0.020	0.060			
59	0.000	0.050	0.020	0.080			
60	0.000	0.100	0.020	0.080			
61	0.000	0.100	0.020	0.120			
62	0.000	0.200	0.020	0.120			
63	0.000	0.200	0.020	0.060			
64	0.000	0.150	0.100	0.060			
65	0.000	0.500	0.100	0.060			
66	0.000	0.100	0.100	0.110			
67	0.000	0.100	0.100	0.100			
68	0.000	0.100	0.100	0.100			
69	0.000	0.100	0.100	0.100			
70	0.000	0.100	0.100	0.100			
71	0.000	0.050	0.400	0.400			
72	0.000	0.050	0.400	0.400			
73	0.000	0.050	0.400	0.400			
74	0.000	0.050	0.400	0.400			
>=75	0.000	1	1	1			

*Salary Scale is (1+ Inflation) x (1+ Salary Merit)

The inflation rate for the Fiscal Year 2017 contributions is 3.0%; however, the inflation rate beginning with the Fiscal Year 2018 contribution will be 2.25%.

HAZARDOUS DUTY, CORRECTIONS AND WILDLLIFE
ACTUARIAL TABLES AND RATES

Age	Disability Rates	Retirement/DROP Rates		Termination Rates (Hazardous Duty and Corrections Only)		Duration	Termination Rates (Wildlife Only)	Salary Merit Scale
		0-24 Years	>=25 Years	0-9 Years	>=10 Years			
<=17	0.000	0.000	0.000	0.000	0.000	0	0.080	0.1117
18	0.000	0.200	0.250	0.500	0.000	1	0.080	0.0519
19	0.000	0.200	0.250	0.500	0.000	2	0.080	0.0388
20	0.000	0.200	0.250	0.460	0.000	3	0.080	0.0379
21	0.000	0.200	0.250	0.420	0.000	4	0.050	0.0330
22	0.000	0.200	0.250	0.380	0.000	5	0.050	0.0320
23	0.000	0.200	0.250	0.350	0.100	6	0.030	0.0316
24	0.000	0.200	0.250	0.320	0.100	7	0.030	0.0311
25	0.000	0.200	0.250	0.290	0.100	8	0.030	0.0306
26	0.000	0.200	0.250	0.270	0.100	9	0.030	0.0301
27	0.000	0.200	0.250	0.250	0.100	10	0.030	0.0296
28	0.000	0.200	0.250	0.230	0.100	11	0.030	0.0291
29	0.000	0.200	0.250	0.210	0.100	12	0.030	0.0286
30	0.000	0.200	0.250	0.200	0.100	13	0.030	0.0282
31	0.000	0.200	0.250	0.200	0.100	14	0.030	0.0277
32	0.000	0.200	0.250	0.200	0.100	15	0.030	0.0272
33	0.000	0.200	0.250	0.200	0.080	16	0.030	0.0267
34	0.000	0.200	0.250	0.200	0.080	17	0.030	0.0262
35	0.002	0.200	0.250	0.200	0.080	18	0.030	0.0257
36	0.002	0.200	0.250	0.180	0.060	19	0.030	0.0252
37	0.002	0.200	0.250	0.180	0.060	20	0.030	0.0248
38	0.002	0.200	0.250	0.180	0.060	21	0.030	0.0243
39	0.002	0.200	0.250	0.180	0.060	22	0.030	0.0243
40	0.003	0.200	0.250	0.180	0.050	23	0.030	0.0238
41	0.003	0.200	0.250	0.180	0.050	24	0.030	0.0238
42	0.003	0.200	0.250	0.180	0.050	25	0.030	0.0243
43	0.003	0.200	0.250	0.180	0.050	26	0.030	0.0243
44	0.003	0.200	0.250	0.180	0.060	27	0.030	0.0155
45	0.003	0.200	0.250	0.170	0.060	28	0.030	0.0155
46	0.003	0.200	0.250	0.170	0.060	29	0.030	0.0150
47	0.003	0.200	0.250	0.170	0.060	30	0.030	0.0058
48	0.003	0.200	0.250	0.170	0.060	31	0.030	0.0058
49	0.003	0.200	0.250	0.170	0.070	32	0.030	0.0058
50	0.003	0.350	0.200	0.130	0.070	33	0.030	0.0058

*Salary Scale is (1+ Inflation) x (1+ Salary Merit)

The inflation rate for the Fiscal Year 2017 contributions is 3.0%; however, the inflation rate beginning with the Fiscal Year 2018 contribution will be 2.25%.

HAZARDOUS DUTY, CORRECTIONS AND WILDLLIFE
ACI'UARIAL TABLES AND RATES

Age	Disability Rates	Retirement/DROP Rates		Termination Rates (Hazardous Duty and Corrections Only)		Duration	Termination Rates (Wildlife Only)	Salary Merit Scale
		0-24 Years	>=25 Years	0-9 Years	>=10 Years			
51	0.003	0.100	0.250	0.130	0.070	34	0.030	0.0058
52	0.005	0.250	0.350	0.130	0.070	35	0.030	0.0058
53	0.005	0.250	0.350	0.130	0.070	36	0.030	0.0058
54	0.005	0.300	0.350	0.130	0.100	37	0.030	0.0058
55	0.008	0.300	0.350	0.130	0.100	38	0.030	0.0058
56	0.008	0.300	0.350	0.130	0.100	39	0.030	0.0058
57	0.008	0.300	0.350	0.130	0.100	>=40	0.030	0.0058
58	0.008	0.300	0.350	0.130	0.100			
59	0.008	0.300	0.350	0.130	0.100			
60	0.000	0.450	0.500	0.130	0.100			
61	0.000	0.400	0.500	0.130	0.100			
62	0.000	0.400	0.500	0.130	0.100			
63	0.000	0.400	0.500	0.130	0.100			
64	0.000	0.400	0.500	0.130	0.100			
65	0.000	0.350	0.500	0.130	0.100			
66	0.000	0.350	0.500	0.130	0.100			
67	0.000	0.350	0.500	0.130	0.100			
68	0.000	0.350	0.500	0.130	0.100			
69	0.000	0.350	0.500	0.130	0.100			
70	0.000	0.500	0.500	0.130	0.100			
71	0.000	0.500	0.500	0.130	0.100			
72	0.000	0.500	0.500	0.130	0.100			
73	0.000	0.500	0.500	0.130	0.100			
74	0.000	0.500	0.500	0.130	0.100			
>=75	0.000	1.000	1.000	0.130	0.100			

*Salary Scale is (1+ Inflation) x (1+ Salary Merit)

The inflation rate for the Fiscal Year 2017 contributions is 3.0%; however, the inflation rate beginning with the Fiscal Year 2018 contribution will be 2.25%.

APPENDIX A
CONTRIBUTION RATES FOR SUB PLANS

Appendix A: Employer Contribution Requirements for FYE 2018 - Sub Plans and Special Funds

The calculations of employer contribution rates for FYE 2018 for employers participating in each sub plan of LASERS are shown below. These contribution requirements are based on revised assumptions and methods.

A. Rank and File Sub Plan

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 87,382,749	$ 1,630,947,158	5.357792%
Shared Amortization Costs	622,886,387		38.191696%
Plan Specific Costs	999,937		0.061310%
Total	$ 711,269,073		43.610798%

B. Appellate Law Clerks Sub Plan

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 752,081	$ 10,950,266	6.868153%
Shared Amortization Costs	4,182,092		38.191693%
Plan Specific Costs	-		0.000000%
Total	$ 4,934,173		45.059846%

C. Pre-2011 Judges and Court Officers Sub Plan

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 2,418,516	$ 33,399,660	7.241140%
Shared Amortization Costs	12,755,897		38.191697%
Plan Specific Costs	-		0.000000%
Total	$ 15,174,413		45.432837%

D. Post-2011 Judges Sub Plan

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 1,209,634	$ 16,711,287	7.238425%
Shared Amortization Costs	6,382,324		38.191696%
Plan Specific Costs	-		0.000000%
Total	$ 7,591,958		45.430122%

E. Legislators Sub Plan

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 51,243	$ 378,056	13.554343%
Shared Amortization Costs	144,386		38.191701%
Plan Specific Costs	-		0.000000%
Total	$ 195,629		51.746044%

G. Corrections Officers Primary Sub Plan

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 191,184	$ 14,931,325	1.280422%
Shared Amortization Costs	5,702,526		38.191694%
Plan Specific Costs	-		0.000000%
Total	$ 5,893,710		39.472116%

H. Adult Probation and Parole Officers Fund

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 50,450	Not Applicable	Not Applicable
Amortization Cost	578,799		
Total	$ 629,249		

I. Corrections Officers Secondary Sub Plan

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 4,245,985	$ 81,811,855	5.189939%
Shared Amortization Costs	31,245,335		38.191696%
Plan Specific Costs	-		0.000000%
Total	$ 35,491,320		43.381635%

J. Wildlife Officers Sub Plan

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 1,530,014	$ 10,475,675	14.605398%
Shared Amortization Costs	4,000,838		38.191697%
Plan Specific Costs	-		0.000000%
Total	$ 5,530,852		52.797095%

K. Peace Officers Sub Plan

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 116,107	$ 2,932,464	3.959367%
Shared Amortization Costs	1,119,958		38.191711%
Plan Specific Costs	-		0.000000%
Total	$ 1,236,065		42.151078%

L. Peace Officers Fund

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 0	Not Applicable	Not Applicable
Amortization Cost	294,421		
Total	$ 294,421		

M. Alcohol Tobacco Control Officers Sub Plan

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 34,873	$ 594,317	5.867740%
Shared Amortization Costs	226,980		38.191714%
Plan Specific Costs	-		0.000000%
Total	$ 261,853		44.059454%

N. ATC Officers Fund

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 0	Not Applicable	Not Applicable
Amortization Cost	80,798		
Total	$ 80,798		

O. Bridge Police Officers Sub Plan

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 7,760	$ 236,038	3.287600%
Shared Amortization Costs	90,147		38.191661%
Plan Specific Costs	-		0.000000%
Total	$ 97,907		41.479261%

P. Harbor Police Officers Sub Plan

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 84,813	$ 1,477,095	5.741877%
Amortization Cost	94,380		6.389568%
Total	$ 179,193		12.131445%

Q. Hazardous Duty Officers Sub Plan

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 6,283,876	$ 109,186,537	5.755175%
Shared Amortization Costs	41,700,191		38.191697%
Plan Specific Costs	138,963		0.127271%
Total	$ 48,123,030		44.074143%

R. Total for All Sub Plans

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 104,308,835	$ 1,914,031,733	5.449692%
Shared Amortization Costs	730,531,441		38.167154%
Plan Specific Costs	1,138,900		0.059503%
Total	$ 835,979,176		43.676349%

S. Total for All Funds

	Dollar Contribution	Projected Payroll	Contribution Rate
Normal Cost	$ 50,450	Not Applicable	Not Applicable
Amortization Cost	1,641,025		
Total	$ 1,691,475		

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, 2008 through June 30, 2013 for the Louisiana State Employees' Retirement System. Their experience study report, dated January 16, 2014, summarized the results. The following table shows the mortality experience during the exposure period:

	Males		Females	
Age	Exposures	Actual Deaths	Exposures	Actual Deaths
<20	386	9	270	5
20-24	3,364	34	3,713	28
25-29	7,290	11	12,708	19
30-34	8,167	38	16,001	58
35-39	8,964	42	16,963	75
40-44	10,872	81	19,417	95
45-49	13,296	88	25,197	121
50-54	16,494	118	31,946	141
55-59	18,038	137	33,429	189
60-64	17,389	185	28,225	204
65-69	12,263	219	19,028	203
70-74	9,801	338	14,921	287
75-79	7,241	377	11,990	424
80-84	5,093	411	10,427	625
85-89	2,688	369	7,208	671
90-94	902	173	3,081	536
95-99	167	49	673	171
100+	24	6	86	27
Total	142,439	2,685	255,283	3,879

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 LASERS-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 males and females (combining actives and retirees because the experience study report did not separate actives' experience from retirees' experience. In order to be fully credible, the experience study is required to have at least 1,082 deaths during the exposure period for each subgroup.

Based on the information in the above table, the experience study is fully credible for each group since their respective number of deaths is more than 1,082. The credibility factors are therefore 100% for the male members and the female members. This means 100% of the experience study results can be taken into account in the determination of the mortality assumption for male members and female members.

[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

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 experience study report did not present the mortality information for active and retiree members separately. Since the RP-2014 did not publish a combined mortality table, the active table and retiree table from RP-2014 were combined into a single table (the two tables overlap for ages 50 through 80) for males and another table for females by age. The combined 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 combined RP-2014 healthy life mortality tables for different ages:

Sample Attained Age	Probability of Death Next Year	
	Male	Female
50	0.29%	0.19%
55	0.43%	0.26%
60	0.62%	0.38%
65	0.96%	0.59%
70	1.53%	0.96%
75	2.50%	1.59%
80	4.18%	2.66%
85	7.75%	6.05%

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 LASERS-derived experience factors.

LASERS-derived experience factors

LASERS-derived experience factors to be applied to the combined (active and retiree) RP-2014 mortality tables were calculated separately for males and females. To do so, the combined RP-2014 mortality tables were projected backward to 2010 (using projection scale MP-2014) to match the central year of the experience study. The ratio of the average mortality rate from the experience study divided by the average mortality rate of the combined RP-2014 mortality table projected backward to 2010 was calculated for each group.

1. For male members, the LASERS-derived experience factor is 158%. That ratio was calculated by dividing the average blended mortality rate (1.89%) by the average mortality rate of the RP-2014 mortality table projected backward to 2010 (1.19%).

2. For female members, the LASERS-derived experience factor is 136%. That ratio was calculated by dividing the average blended mortality rate (1.52%) by the average mortality rate of the RP-2014 mortality table projected backward to 2010 (1.12%).

Impact on mortality rates

Mortality table	Average Mortality Rate
(a) Experience Study Results	1.65%
(b) RP-2000 projected to 2015 with Scale AA	1.28%
(c) Experience-adjusted RP-2014 (base rates)	1.65%

The above table compares (a) the average mortality rates from the raw results of the experience study, (b) the average mortality rate assumed by LASERS' actuary using the older RP-2000 table projected to 2015 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 exactly equal to the one from the experience study since the experience study was fully credible and was incorporated in the determination of the mortality assumption.

Reflecting higher mortality rates as compared to the average mortality rate from LASERS' actuary resulted in an initial decrease in costs and liabilities. However, after applying the generational mortality improvement scale MP-2016 to the experience-adjusted RP-2014 tables, the overall resulting liability was still slightly lower than the liability from LASERS' actuary and the employer contribution rate was slightly higher. Overall, not a large difference.

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. More current and rigorous actuarial practices are always an improvement, especially if they can be implemented without but trouble.

MP-2016 Improvement Scale

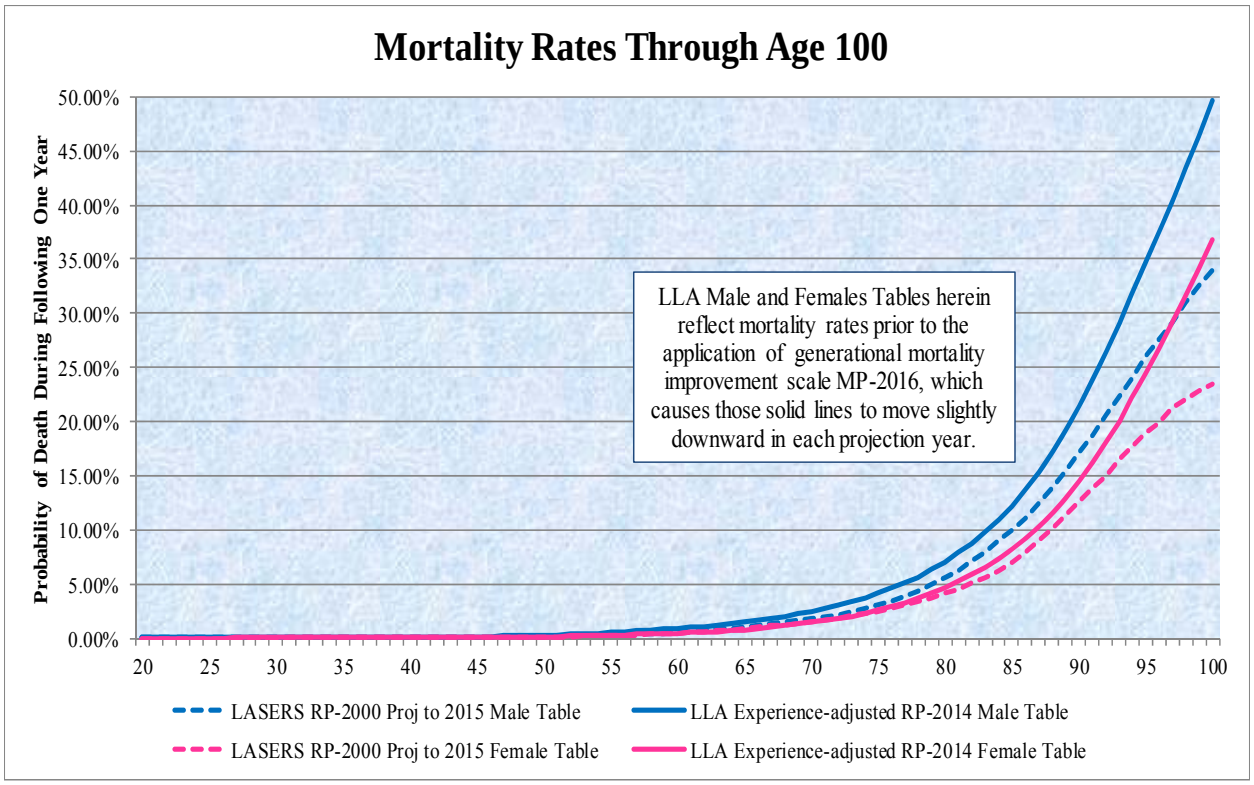
The improvement scale projects the mortality rates from the base year (2014) of the mortality table to future years to account for future improvement in the mortality rates. The MP-2016 improvement scale, released in October 2016, is intended to be used along with the RP-2014 mortality tables and is 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.

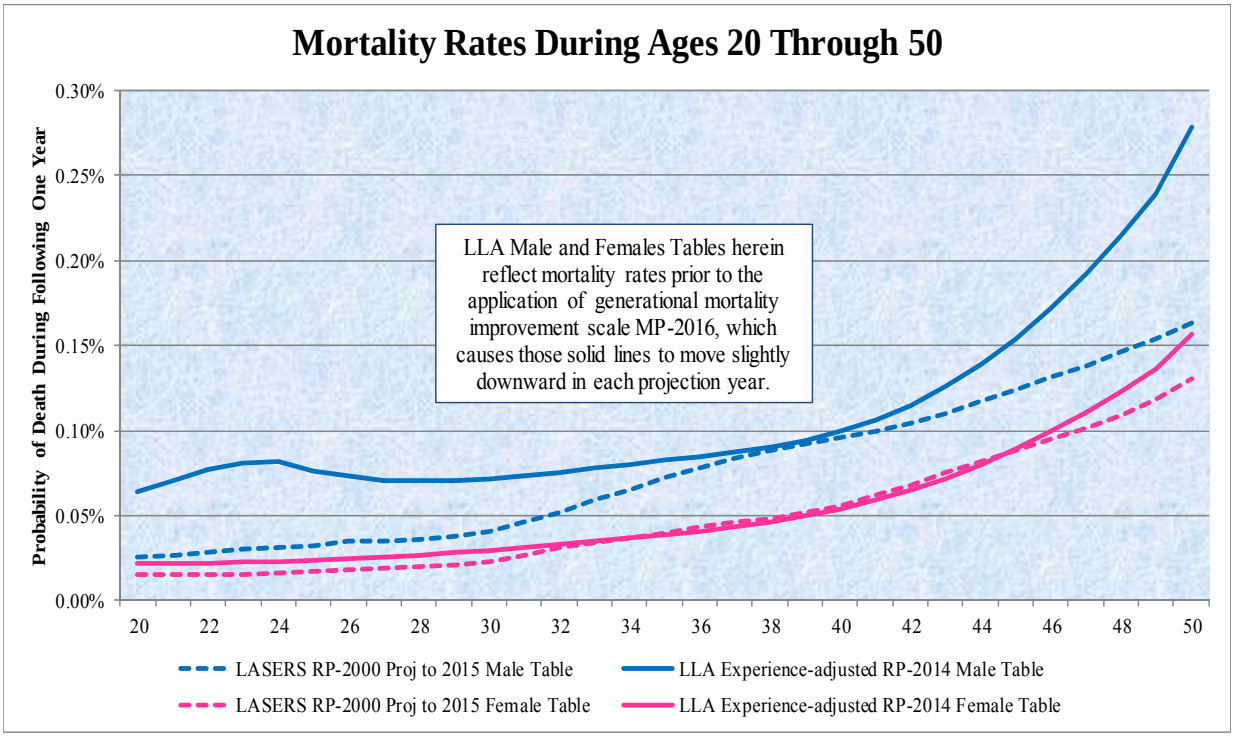
Four graphs on the following pages show the mortality rates for the current mortality assumption (RP-2000 mortality tables projected to 2015 with improvement scale AA) and the new mortality assumption (Experience-adjusted RP-2014 mortality tables) prior to the application of the MP-2016 improvement scale. The graphs show the mortality rates for males and females for ages 20 to 100 (the last three graphs show a breakdown of the first graph for separate age ranges).

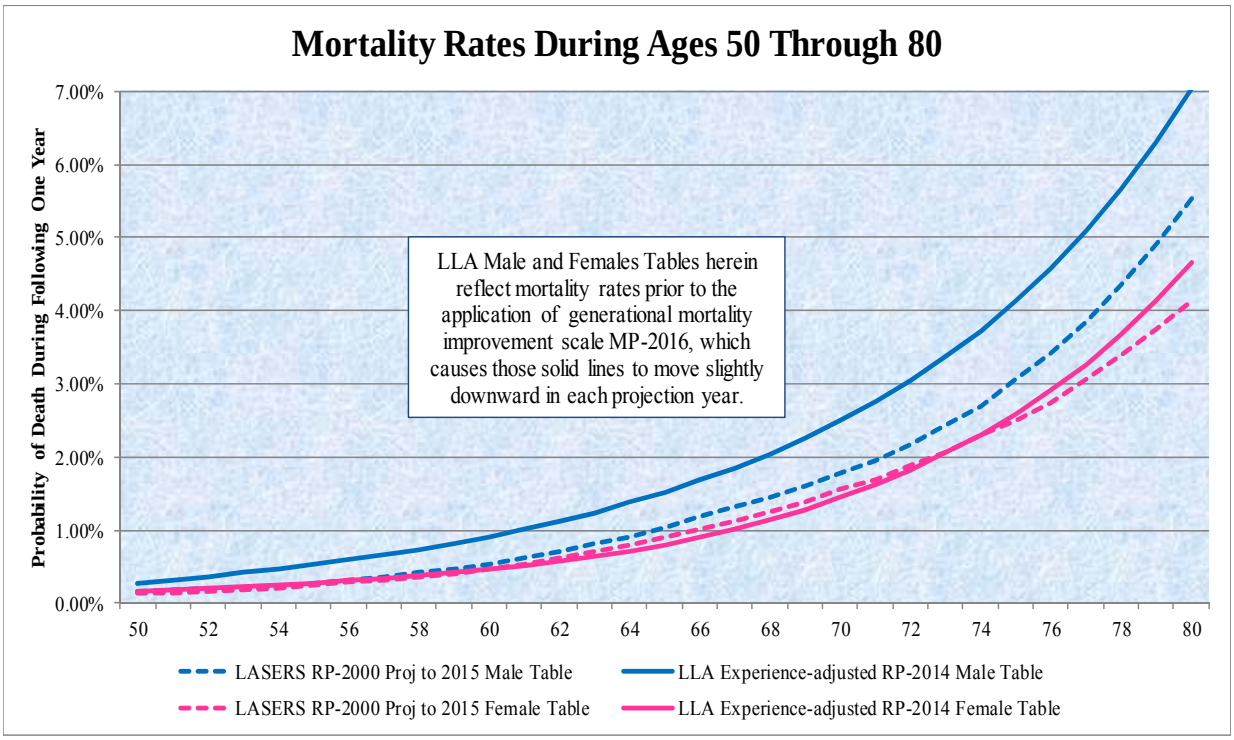
Actuarial Practice

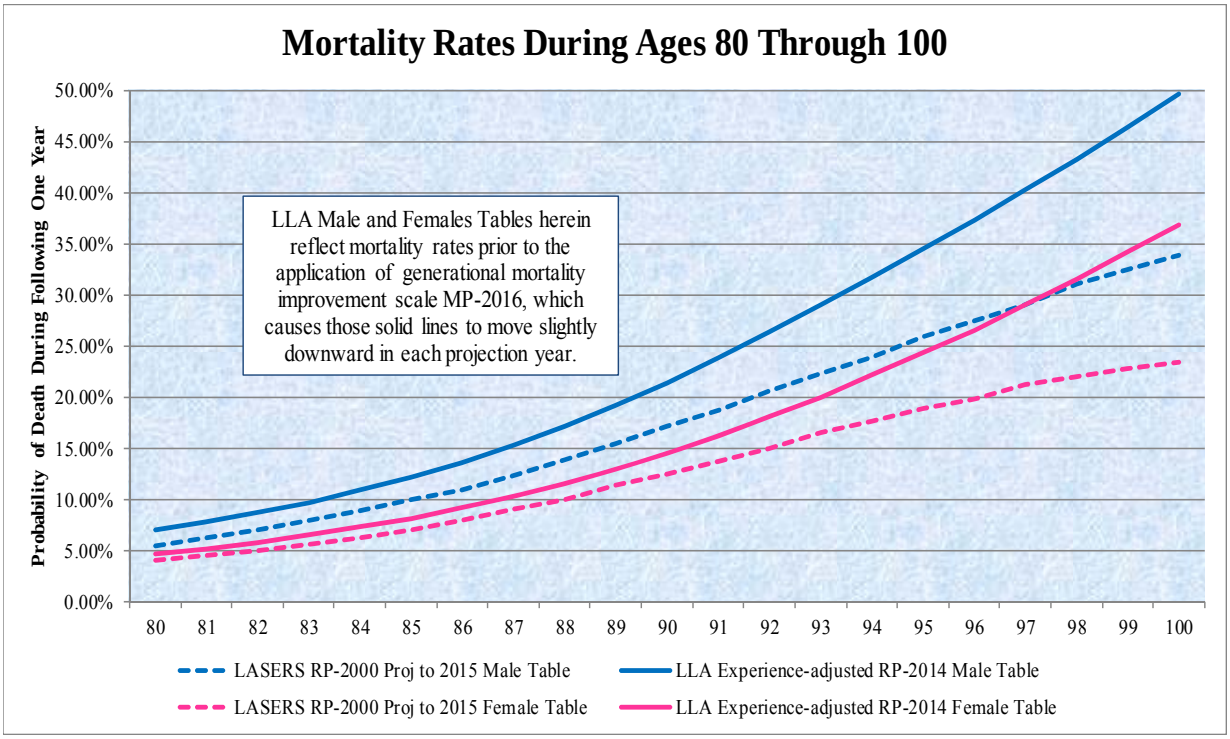
The LLA's actuary recognizes the experience studies for larger systems are generally performed every five years and the next one for LASERS is not scheduled until 2018. However, it is also generally accepted among retirement system executives, board members and actuaries that if events occur or if better 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 Through Age 100
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%
20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
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.
LASERS RP-2000 Proj to 2015 Male Table
LLA Experience-adjusted RP-2014 Male Table
LASERS RP-2000 Proj to 2015 Female Table
LLA Experience-adjusted RP-2014 Female Table


Mortality Rates During Ages 20 Through 50
Probability of Death During Following One Year
0.30%
0.25%
0.20%
0.15%
0.10%
0.05%
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.
LASERS RP-2000 Proj to 2015 Male Table
LLA Experience-adjusted RP-2014 Male Table
LASERS RP-2000 Proj to 2015 Female Table
LLA Experience-adjusted RP-2014 Female Table


Mortality Rates During Ages 50 Through 80
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.
LASERS RP-2000 Proj to 2015 Male Table
LLA Experience-adjusted RP-2014 Male Table
LASERS RP-2000 Proj to 2015 Female Table
LLA Experience-adjusted RP-2014 Female Table


Mortality Rates During Ages 80 Through 100
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.
LASERS RP-2000 Proj to 2015 Male Table
LLA Experience-adjusted RP-2014 Male Table
LASERS RP-2000 Proj to 2015 Female Table
LLA Experience-adjusted RP-2014 Female Table

APPENDIX C
BASIS FOR ECONOMIC ASSUMPTIONS

LASERS' current net investment return assumption is 8.15%, while the discount rate is 7.75%. The 8.15% is derived from adding 40 basis points back into the 7.75% discount rate to obtain the net investment return assumption.[2] Because of the manner which LASERS measures the cost of administrative expenses (by reducing the net investment return assumption by 15 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 LASERS there is a difference between the net investment return assumption and the discount rate – a substantial difference.

- LASERS' current net investment return assumption 8.15%
- LASERS' 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 LASERS actuarial valuation report prepared by the system's actuary and dated September 23, 2016. Page 9: "Per Actuarial Standard of Practice Statement 27, (paragraph 3.8.3.e.) the investment return assumption should be reduced to reflect investment and administrative expenses that are paid form plan assets and not otherwise recognized. The discount rate was developed with a margin of 15 basis points to account for these expenses, therefore these losses are expected to be offset by long-term investment earnings.. Page 10: "The net discount rate is determined as the gross expected long-term return less investment and administrative expenses and the expectd return used to provide 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 7.25%. 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 (7.25%).

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

A LOOK AT THE PAST

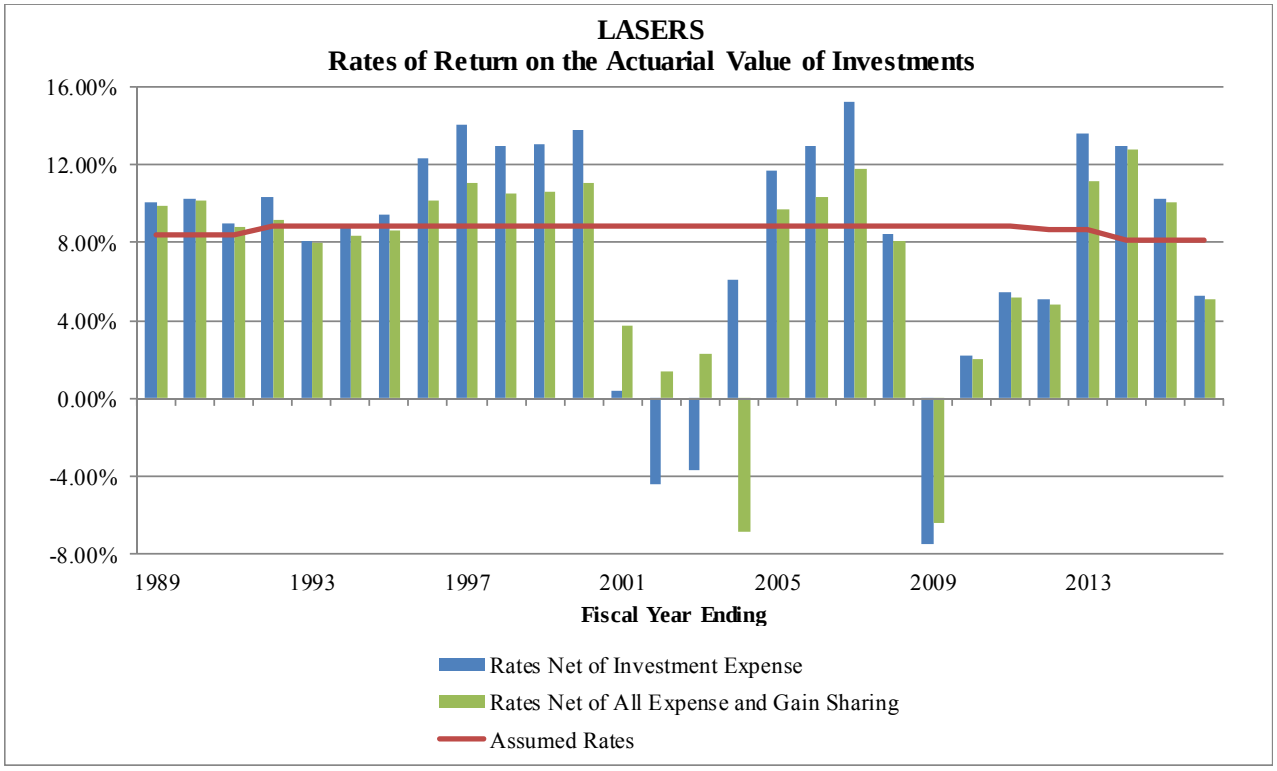
Historical Rates of Return on Investments

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 (0.15%) 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). 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.

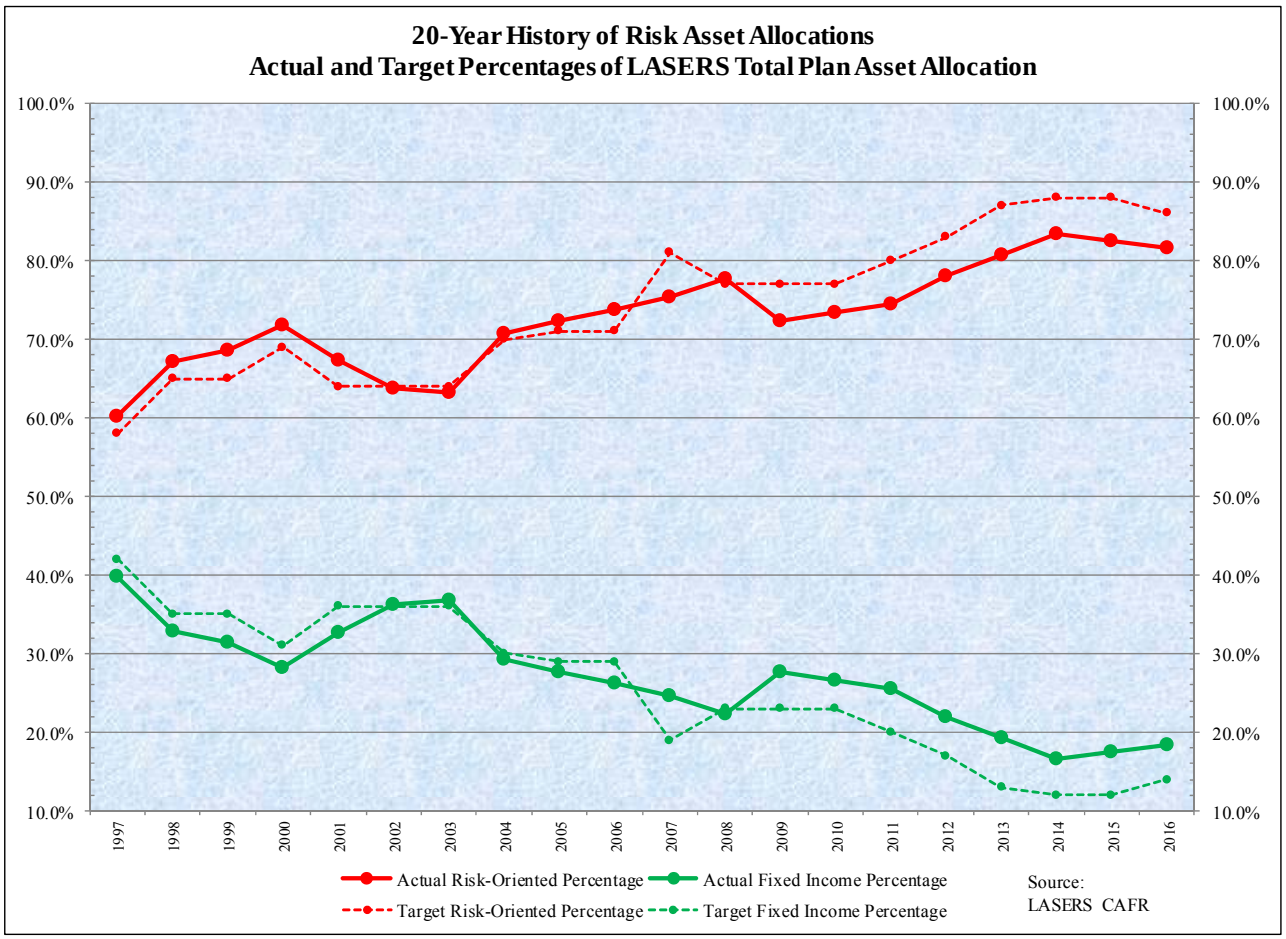
Volatility in the unfunded accrued liability (and the net pension liability on the balance sheet of the State and other participating employers) can affect the credit rating, covenants, borrowing costs, contribution rates and other ramifications. Volatility in the employer contribution rates can affect 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. LASERS had very impressive rates of return from 1995 through 1999, as did most other pension funds.

[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

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.

Average Compound Rate over the Past:	Actual	Assumed	Deficit*
5 Years	9.41%	8.50%	-0.91%
10 Years	7.66%	8.70%	1.04%
15 Years	5.69%	8.77%	3.08%
20 Years	7.52%	8.80%	1.28%
25 Years	7.85%	8.80%	0.95%
28 Years	8.02%	8.77%	0.75%

*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 8.77% while actual rates have averaged only 5.69%. 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 2001-2004 included substantial underperformance compared to the long-term assumption. Each of the five years 2009-2012 also included substantial underperformance compared to the long-term assumption. Significant shortfalls compared to the current 8.15% 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. LASERS 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 8.15% to 7.25%. 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 LASERS' 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 12.1 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 LASERS' future benefit stream is approximately 12.1 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 3.00% inflation assumption built into the LASERS 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 LASERS' asset allocation policy at the time.

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

2016 LASERS Target Asset Allocation			
Risk Assets		**Fixed Income Assets**	
Domestic Large Cap	14.0%	Core Fixed Income	4.0%
Domestic Mid Cap	4.0%	Domestic High Yield	4.0%
Domestic Small Cap	7.0%	Global Multi-Sector	4.0%
Established International (Lg Cap)	15.0%	Emerging Market Debt	2.0%
Established International (Sm Cap)	5.0%	Total Fixed Income Assets	14.0%
Emerging International Equity	12.0%		
Private Equity	14.0%		
Absolute Return	8.0%		
Global Asset Allocation	7.0%		
Total Risk Assets	86.0%	Total Asset Allocation	100.0%

Source: LASERS Investment Policy Statement (dated 5/19/2016)

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 171 basis points (1.71%) for LASERS' 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 (Percentiles)			Probability of exceeding	Probability of exceeding	Probability of exceeding	Probability of exceeding
	40th	50th	60th	8.15%	7.75%	7.25%	7.00%
(1)	(2)	(3)	(4)	(5)	(6)	(6)	(6)
1	5.44%	6.46%	7.49%	33.98%	37.61%	42.32%	44.72%
2	6.10%	7.01%	7.94%	37.77%	41.99%	47.42%	50.16%
3	6.01%	6.97%	7.94%	37.94%	41.94%	47.09%	49.70%
4	6.35%	7.27%	8.19%	40.47%	44.74%	50.18%	52.91%
5	6.38%	7.30%	8.23%	40.84%	45.12%	50.56%	53.29%
6	6.21%	7.21%	8.21%	40.55%	44.51%	49.55%	52.09%
7	6.26%	7.34%	8.43%	42.51%	46.18%	50.82%	53.15%
8	7.21%	8.18%	9.15%	50.26%	54.41%	59.55%	62.07%
Average	**6.24%**	**7.22%**	**8.20%**	**40.54%**	**44.56%**	**49.68%**	**52.26%**
Average of Middle 6	**6.22%**	**7.18%**	**8.16%**	**40.01%**	**44.08%**	**49.27%**	**51.88%**

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 7.22% rate of return over the next 15 years. The probability of achieving the current 8.15% *compound* investment return assumption only 40.54%. 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.

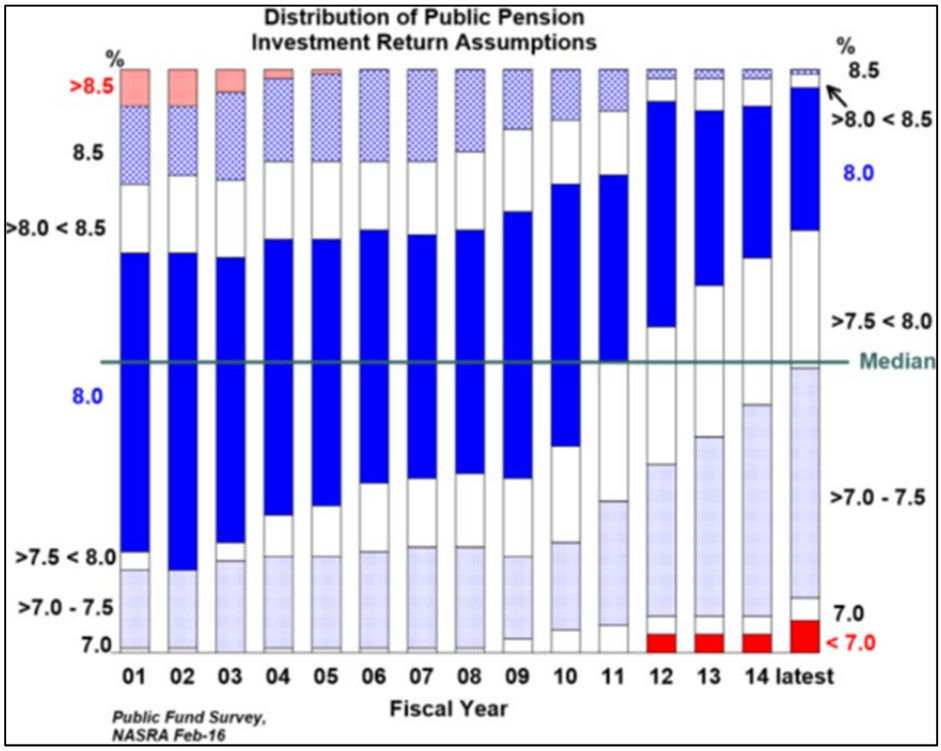
Investment Consultant	Investment Consultant Expected Nominal 1-Yr Return	Investment Consultant Inflation Assumption	Expected Real Return (2)–(3)	Actuary Inflation Assumption	Expected Nominal Return (4)+(5)	Investment and Active Management Expenses	Recognized Value for Active Management	Expected Nominal 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	7.98%	2.50%	5.48%	2.25%	7.73%	0.63%	0.53%	7.63%		15.98%
2	7.99%	2.20%	5.79%	2.25%	8.04%	0.63%	0.53%	7.94%		14.23%
3	8.10%	2.25%	5.85%	2.25%	8.10%	0.63%	0.53%	8.00%		15.00%
4	7.62%	1.56%	6.05%	2.25%	8.30%	0.63%	0.53%	8.20%		14.32%
5	8.35%	2.26%	6.09%	2.25%	8.34%	0.63%	0.53%	8.24%		14.33%
6	8.15%	2.00%	6.14%	2.25%	8.39%	0.63%	0.53%	8.29%		15.45%
7	8.73%	2.25%	6.48%	2.25%	8.73%	0.63%	0.53%	8.63%		16.90%
8	9.26%	2.20%	7.06%	2.25%	9.31%	0.63%	0.53%	9.21%		15.11%
Average	**8.27%**	**2.15%**	**6.12%**	**2.25%**	**8.37%**	**0.63%**	**0.53%**	**8.27%**		**15.16%**
Average of Middle 6	**8.15%**	**2.09%**	**6.07%**	**2.25%**	**8.32%**	**0.63%**	**0.53%**	**8.22%**		**15.04%**

Conclusion:

To repeat, the most appropriate net investment return assumption to use for the LLA actuary's 2016 LASERS 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 LASERS. It is not useful for actually informing assumption-setters concerning the economic forecasts applicable to LASERS.

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 LASERS, 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 LASERS is 8.10%, not 7.75%.

APPENDIX D
BASIS FOR TREATMENT OF ADMINISTRATIVE EXPENSES

Appendix D: Basis for Treatment of Administrative Expenses

As mentioned in the Summary and Conclusions of this actuarial report, currently, LASERS recognizes the cost of paying administrative expenses required to deliver plan benefits by reducing the net investment return assumption by 15 basis points (i.e., 0.15% 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 averaged 0.92% of covered payroll. Therefore, the LLA's actuary has used a normal cost load of 0.92% 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 LASERS 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 for the cost of delivering the benefits. This load on the normal cost is common in actuarial practice and is 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 contribution year be included in the actuarially required employer contribution beginning with the first fiscal year in which the projected aggregate employer contribution rate, calculated without regard to any changes in the board-approved actuarial valuation rate, will not increase.

The LLA's actuary believes this more transparent and consistent approach should, and may be, implemented under the current stator 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	15,201,829	14,951,127	15,500,163	15,907,599	14,810,539	15,877,682	15,615,605	
Other Post-Employment Benefits Expense	1,561,605	1,310,517	999,650	982,754	1,103,488	940,845	982,858	
Depreciation and Amortization Expense	2,134,563	1,919,628	1,941,249	2,041,894	1,724,101	1,193,314	419,718	
Total Administrative Expenses	18,897,997	18,181,272	18,441,062	18,932,247	17,638,128	18,011,841	17,018,181	
As a Percent of Expected Covered Payroll	0.74%	0.75%	0.79%	0.97%	0.97%	0.97%	0.92%	0.92%
As a Percent of Beginning Market Value	0.27%	0.23%	0.19%	0.20%	0.17%	0.15%	0.15%	0.17%
Expected Covered Payroll for the Year	2,546,456,790	2,408,839,604	2,341,703,286	1,951,987,750	1,813,759,357	1,856,735,292	1,842,286,184	
Beginning Market Value of Total Fund	7,100,333,387	8,054,678,765	9,703,496,641	9,515,774,342	10,327,598,351	11,624,853,426	11,415,150,926	

Source: LASERS Comprehensive and Component Unit Annual Financial Reports

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

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

Appendix E: Basis for Treatment of Gain-Sharing

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

Currently, LASERS 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 LASERS' 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 8.15% 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 0.15% 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 LASERS' 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 7.25% net return assumption for valuation purposes), the LLA's actuary and GRS determined that a 0.40% 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 7.25% and an single equivalent COLA increase of 0.40% 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 8.27% and standard deviation of 15.16% to simulate the operation of LASERS' complex gain-sharing/COLA program. That 8.27% 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 15.16% 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:

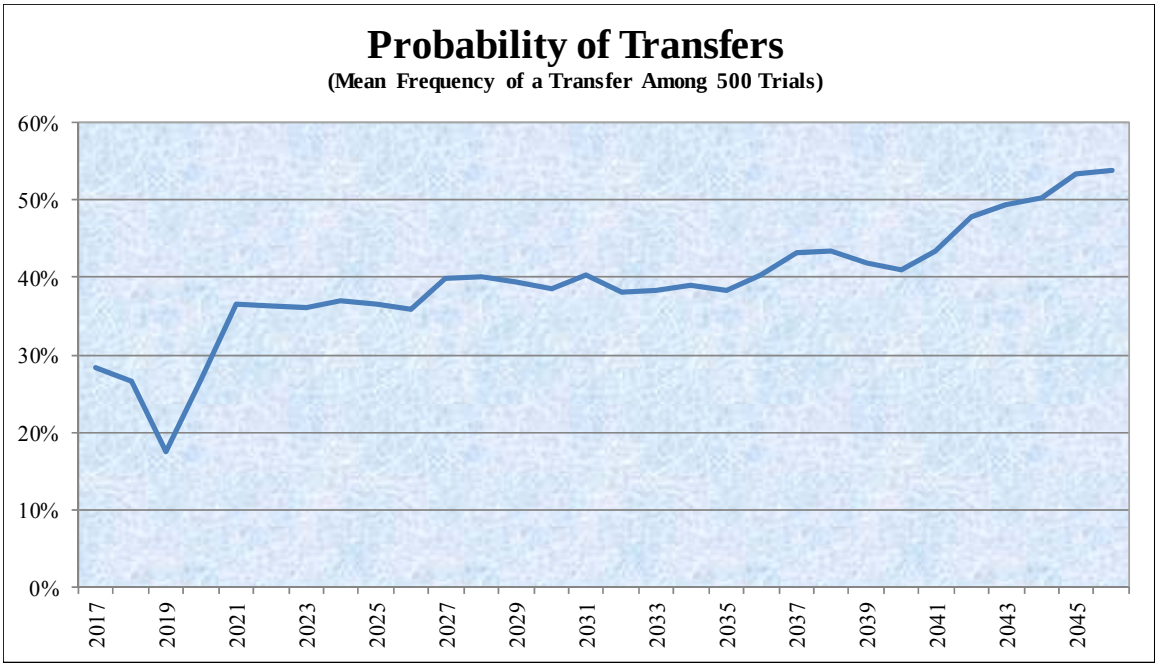
1. Modelling future new hires and future actuarial valuations,
2. Modelling the markets and future rates of return using generally acceptable techniques,
3. Modelling the actuarial rate of return,
4. Modelling the dollar hurdle,
5. Modelling the limitations on the experience account,
6. Modelling the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

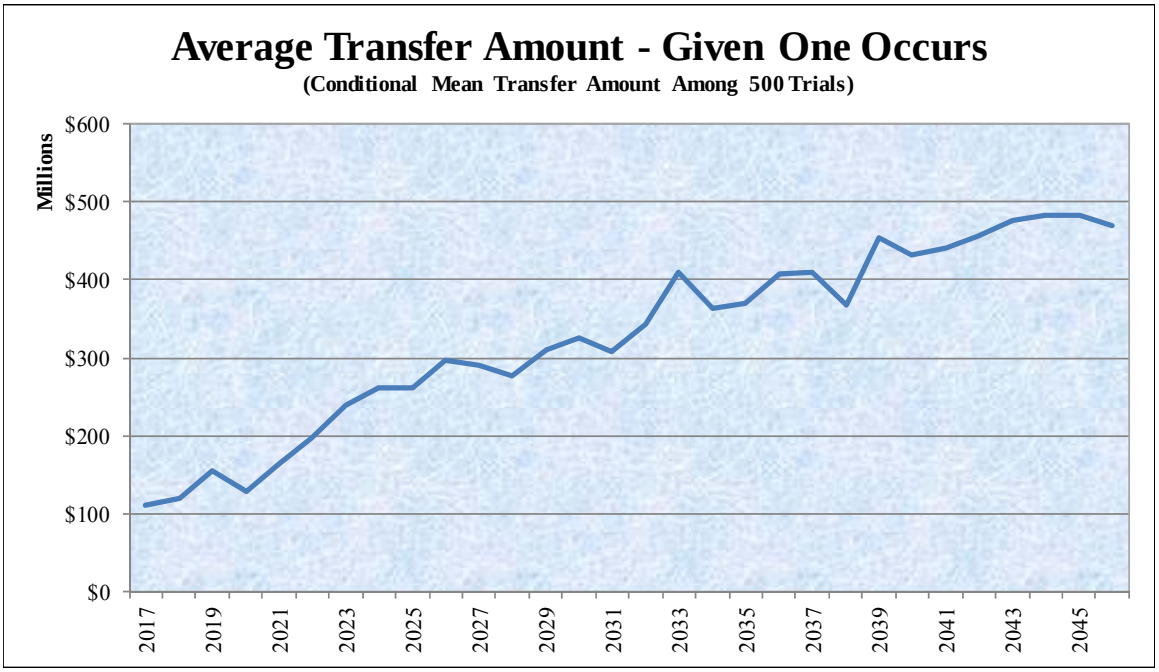
In some years, the model expects a transfer to the experience account and in some years expects none. For each year in which the model expects a transfer, the amount can vary widely.

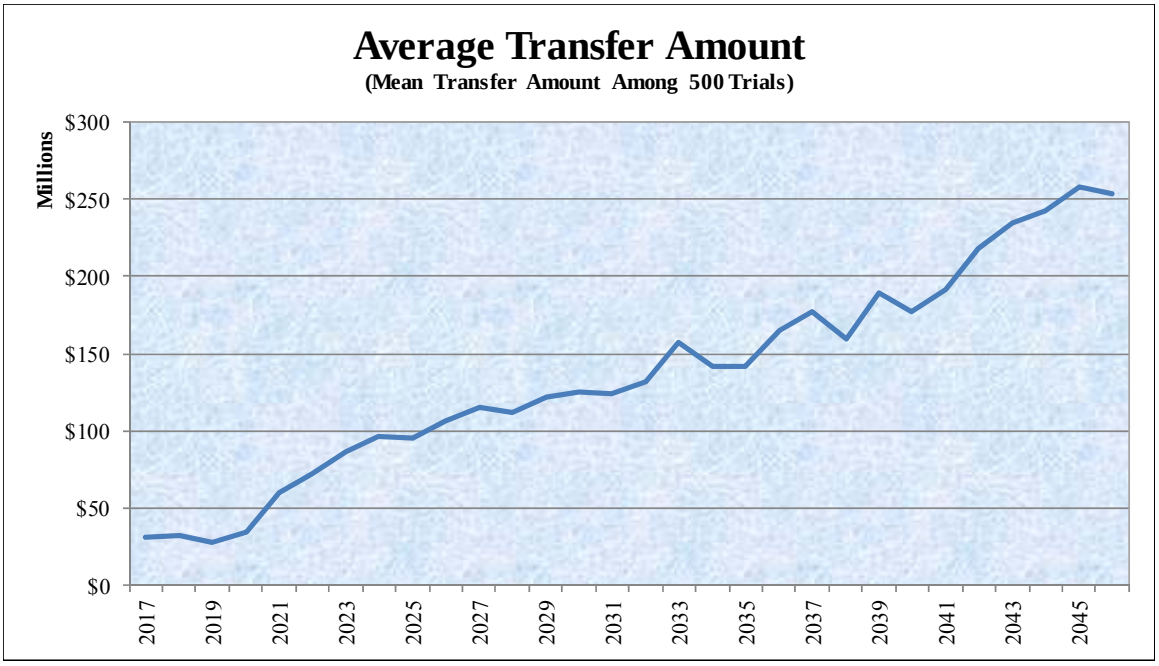
The mean (average) amount expected to be transferred to the experience account each year was captured and their present value calculated. It was determined that a 0.40% annual cost-of-living increase (COLA) would produce the same additional present value. It is, therefore, considered the single equivalent 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 LASERS' 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