

**FIREFIGHTERS'
RETIREMENT SYSTEM**

ACTUARIAL VALUATION AS OF
JUNE 30, 2017

G. S. CURRAN & COMPANY, LTD.

Actuarial Services

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October 23, 2017

Board of Trustees
Firefighters' Retirement System
3100 Brentwood Drive
Baton Rouge, LA 70809

Gentlemen:

We are pleased to present our report on the actuarial valuation of the Firefighters' Retirement System for the fiscal year ending June 30, 2017. Our report is based on the actuarial assumptions specified and relies on the data supplied by the system's administrators and accountants. This report was prepared at the request of the Board of Trustees of Firefighters' Retirement System of the State of Louisiana. The primary purpose of this report is to determine the actuarially required contribution for the retirement system for the fiscal year ending June 30, 2018 and to recommend the net direct employer contribution rate for Fiscal 2019. This report does not contain the information necessary for accounting disclosures as required by Governmental Accounting Standards Board (GASB) Statements 67 and 68; that information is included in a separate report. This report was prepared exclusively for Firefighters' Retirement System for a specific limited purpose. It is not for the use or benefit of any third party for any purpose.

In our opinion, all of the assumptions on which this valuation is based are reasonable individually and in the aggregate. Both economic and demographic assumptions are based on our expectations for future experience for the fund. This report has been prepared in accordance with generally accepted actuarial principles and practices, and to the best of our knowledge and belief, fairly reflects the actuarial present values and costs stated herein. The undersigned actuaries are members of the American Academy of Actuaries and have met the qualification standards for the American Academy of Actuaries to render the actuarial opinions incorporated in this report, and are available to provide further information or answer any questions with respect to this valuation.

Sincerely,

G. S. CURRAN & COMPANY, LTD.

By: 
Gary Curran, F.C.A., M.A.A.A., A.S.A.


Gregory Curran, F.C.A., M.A.A.A., A.S.A.

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SUMMARY OF VALUATION RESULTS FIREFIGHTERS' RETIREMENT SYSTEM

Valuation Date:	June 30, 2017	June 30, 2016
Census Summary:		
Active Members	4,429	4,362
Retired Members and Survivors	2,289	2,213
DROP Participants	173	173
Terminated Due a Deferred Benefit	72	72
Terminated Due a Refund	597	558
Payroll (excluding DROP participants)	\$ 232,500,397	\$ 225,301,112
Benefits in Payment (excluding DROP accruals):	\$ 88,444,685	\$ 83,899,034
Present Value of Future Benefits	\$ 2,733,929,875	\$ 2,589,976,176
Actuarial Accrued Liability (EAN):	\$ 2,166,881,556	\$ 2,053,982,618
Unfunded Actuarial Accrued Liability:	\$ 523,874,481	\$ 503,720,873
Actuarial Value of Assets (AVA):	\$ 1,643,007,075	\$ 1,550,261,745
Market Value of Assets (MVA):	\$ 1,593,696,648	\$ 1,399,892,212
Ratio of AVA to Actuarial Accrued Liability:	75.82%	75.48%
	Fiscal 2017	Fiscal 2016
Market Rate of Return:	13.6%	-2.3%
Actuarial Rate of Return:	5.7%	3.1%
	Fiscal 2018	Fiscal 2017
Employers' Normal Cost (Mid-year):	\$ 33,146,680	\$ 30,801,348
Amortization Cost (Mid-year):	\$ 59,779,684	\$ 55,712,536
Estimated Administrative Cost	\$ 1,609,870	\$ 1,623,897
Expected Insurance Premium Taxes Due	\$ 25,953,989	\$ 25,310,647
Net Direct Employer Actuarially Required Contributions:	\$ 68,582,245	\$ 62,827,134
Projected Payroll:	\$ 239,205,188	\$ 231,928,094
Actual Employee Contribution Rate: *	10.00%	10.00%
Actual Net Direct Employer Contribution Rate: *	26.50%	25.25%
Actuarially Required Net Direct Employer Contribution Rate: *	28.67%	27.09%
	Fiscal 2019	Fiscal 2018
Minimum Recommended Net Direct Employer Cont. Rate: *	26.25%	26.50%

* The above rates are for members with earnings greater than the Department of HHS poverty guidelines. For members with earnings below the poverty guidelines, employer rates will be 2.0% higher and employee rates will be 2.0% lower.

GENERAL COMMENTS

The values and calculations in this report were determined by applying statistical analysis and projections to system data and the assumptions listed. There is sometimes a tendency for readers to either dismiss results as mere “guesses” or alternatively to ascribe a greater degree of accuracy to the results than is warranted. In fact, neither of these assessments is valid. Actuarial calculations by their very nature involve estimations. As such, it is likely that eventual results will differ from those presented. The degree to which such differences evolve will depend on several factors including the completeness and accuracy of the data utilized, the degree to which assumptions approximate future experience, and the extent to which the mathematical model accurately describes the plan’s design and future outcomes.

Data quality varies from system to system and year to year. The data inputs involve both asset information and census information of plan participants. In both cases, the actuary must rely on third parties; nevertheless, steps are taken to reduce the probability and degree of errors. The development of assumptions is primarily the task of the actuary; however, information and advice from plan administrators, staff, and other professionals may be factored into the formation of assumptions. The process of setting assumptions is based primarily on analysis of past trends, but modification of historical experience is often required when the actuary has reason to believe that future circumstances may vary significantly from the past. Setting assumptions includes but is not limited to collecting past plan experience and studying general population demographics and economic factors from the past. The actuary will also consider current and future macro-economic and financial expectations as well as factors that are likely to impact the particular group under consideration. Hence, assumptions will also reflect the actuary’s judgment with regard to future changes in plan population and decrements in view of the particular factors which impact participants. Thus, the process of setting assumptions is not mere “guess work” but rather a process of mathematical analysis of past experience and of those factors likely to impact the future.

One area where the actuary is limited in his ability to develop accurate estimates is the projection of future investment earnings. The difficulties here are significant. First, the future is rarely like the past, and the data points available to develop stochastic trials are far fewer than the number required for statistical significance. In this area, some guess work is inevitable. However, there are tools available to lay a foundation for making estimates with an expectation of reliability. Although past data is limited, that which is available is likely to provide some insight into the future. This data consists of general economic and financial values such as past rates of inflation, rates of return variance, and correlations of returns among various asset classes along with the actual asset experience of the plan. In addition, the actuary can review the current asset market environment as well as economic forecasts from governmental and investment research groups to form a reasonable opinion with regard to probable future investment experience for the plan.

All of the above efforts would be in vain if the assumption process was static, and the plan would have to deal with the consequences of actual experience differing from assumptions after forty or fifty years of compounded errors. However, actuarial funding methods for pension plans all allow for periodic corrections of assumptions to conform with reality as it unfolds. This process of repeated correction of estimates produces results which although imperfect are nevertheless a reasonable approach to determine the contribution levels which will provide for the future benefits of plan participants.

COMMENTS ON DATA

For the valuation, the administrator of the system furnished a census in electronic format derived from the system's master data processing file indicating each active covered employee's sex, date of birth, service credit, annual salary, and accumulated contributions. Information on retirees detailing dates of birth of retirees and beneficiaries, as well as option categories and benefit amounts, was provided in like manner. In addition, data was supplied on former employees who are vested or who have contributions remaining on deposit. As illustrated in Exhibit VIII, there are 4,429 active contributing members in the system of whom 1,858 have vested retirement benefits; in addition, there are 173 participants in the Deferred Retirement Option Plan (DROP); 2,289 former members or their beneficiaries are receiving retirement benefits. An additional 669 terminated members have contributions remaining on deposit with the system; of this number 72 have vested rights for future retirement benefits. All individuals submitted were included in the valuation.

Census data submitted to our office is tested for errors. Several types of census data errors are possible; to ensure that the valuation results are as accurate as possible, a significant effort is made to identify and correct these errors. In order to minimize coverage errors (i.e., missing or duplicated individual records) the records are checked for duplicates, and a comparison of the current year's records to those submitted in prior years is made. Changes in status, new records, and previous records, which have no corresponding current record, are identified. This portion of the review indicates the annual flow of members from one status to another and is used to check some of the actuarial assumptions, such as retirement rates, rates of withdrawal, and mortality. In addition, the census is checked for reasonableness in several areas, such as age, service, salary, and current benefits. The records identified by this review as questionable are checked against data from prior valuations; those not recently verified are included in a detailed list of items sent to the system's administrative staff for verification and/or correction. Once the identified data has been researched and verified or corrected, it is returned to us for use in the valuation. Occasionally some requested information is either unavailable or impractical to obtain. In such cases, values may be assigned to missing data. The assigned values are based on information from similar records or based on information implied from other data in the record.

In addition to the statistical information provided on the system's participants, the system's administrator furnished general information related to other aspects of the system's expenses, benefits and funding. Valuation asset values as well as income and expenses for the fiscal year were based on information furnished by the by the Louisiana Legislative Auditor's office. As indicated in the system's financial statements, the net market value of the system's assets was \$1,593,696,648 as of June 30, 2017. Net investment income for Fiscal 2017 measured on a market value basis was \$190,196,312. Contributions to the system for the fiscal year totaled \$109,315,892; benefits and expenses amounted to \$105,707,768.

Notwithstanding our efforts to review both census and financial data for apparent errors, we must rely upon the system's administrative staff and accountants to provide accurate information. Our review of submitted information is limited to validation of reasonableness and consistency. Verification of submitted data to source information is beyond the scope of our efforts.

COMMENTS ON ACTUARIAL METHODS AND ASSUMPTIONS

This valuation is based on the Entry Age Normal actuarial cost method. Under the provisions of Louisiana R.S. 11:103 the funding excess for the plan which was determined to be \$239,425 as of June 30, 1989 was amortized over thirty years. Subsequent experience gains and losses were amortized over fifteen years. Contribution gains or losses arising from contributions in excess of or less than the required contributions are amortized over the same period as experience gains and losses. Further changes in the unfunded accrued liability generated by mergers of groups of firefighters into the system are amortized over thirty years. All non-merger amortization bases in existence on June 30, 2002, were combined, offset, and re-amortized through June 30, 2029, in accordance with R.S. 11:103(D). The aggregate value of the bases as of that date was \$175,578,584. Beginning with Fiscal 2010, actuarial gains and losses, as well as contribution gains and losses, were amortized over a 20 year period. Each year thereafter, the amortization period was set to decrease by one year until attaining a 15 year amortization period. All changes in assumptions or the method of valuing assets are amortized over 15 years. All amortization payments are on a level dollar basis.

The cost method used for this valuation generally produces normal costs which are level as a percentage of pay if assumptions are met and the composition of the active group with regard to age, sex, and service is stable. Overall costs may increase or decrease depending on payroll growth. Since payments on all of the funds amortization bases are level any payroll growth will reduce future amortization payments as a percentage of payroll. Should overall payroll contract, amortization payments will increase as a percentage of payroll.

In February of 2017, a recommendation was made to the Board of Trustees to reduce the long-term rate of return assumption. The recommendation was formed after an analysis of the system's portfolio along with expected long-term rates of return, standard deviations of return, and correlations between asset classes collected from a number of investment consulting firms in addition to the system's investment consultants, New England Pension Consultants. Based on this analysis and after discussions with the Board, a plan was approved to reduce the 7.5% valuation interest rate in effect for the Fiscal 2016 actuarial valuation to 7.0% over the coming five actuarial valuations with reductions of 0.10% each year. Therefore, the assumed rate of return for the Fiscal 2017 valuation was set at 7.40%. In addition, the inflation rate will be reduced over the coming valuations. For 2017, an assumed rate of inflation of 2.775% was implicit in the assumed rate of return. The remaining actuarial assumptions utilized for this report are based on the results of an actuarial experience study for the period July 1, 2009 – June 30, 2014, unless otherwise specified in this report. Additional details are given in the complete Experience Report for fiscal years 2010 through 2014.

Although the Board of Trustees has authority to grant ad hoc Cost of Living Increases (COLAs) under limited circumstances, these COLAs have not been shown to have a historical pattern, the amounts of the COLAs have not been relative to a defined cost-of-living or inflation index, and there is no evidence to conclude that COLAs will be granted on a predictable basis in the future. Therefore, for purposes of determining the present value of benefits, these COLAs were deemed not to be substantively automatic and the present value of benefits excludes COLAs not previously granted by the Board of Trustees.

The current year actuarial assumptions utilized for the report are outlined on pages forty through forty-three. All assumptions used are based on estimates of future long-term experience for the fund. All calculations, recommendations, and conclusions are based on the assumptions specified. To the extent that prospective experience differs from that assumed, adjustments to contribution levels will be

required. Such differences will be revealed in future actuarial valuations. The net effect of the changes in assumptions increased the interest-adjusted amortization payments on the system's UAL by \$2,466,936 which corresponds to payments of 1.03% of fiscal 2018 projected payroll.

RISK FACTORS

Defined benefit pension plans are subject to a number of risks. These can be related either to plan assets or liabilities. In order to pay benefits, the plan must have sufficient assets. Several factors can lead to asset levels which are below those required to pay promised benefits. The first risk in this regard is the failure to contribute adequate funds to the plan. In some ways, this is the greatest risk, since other risks can usually be addressed by adequate actuarial funding.

All pension plans are subject to asset performance risk. Asset performance is comprised of the real rates of return earned on the portfolio of investments plus the underlying inflation rate. High levels of inflation or deflation can present the plan with problems by either reducing the purchasing power of plan benefits or impairing asset values in the trust. Asset performance over the long run depends not only on average returns but also on the volatility of returns. Two portfolios of identical size with identical average rates of return will accumulate different levels of assets if the volatility of returns differs since increased volatility reduces the accumulation of assets. Another element of asset risk is reinvestment risk. Recent interest rate declines have subjected pension plans to an increase in this risk. As fixed income securities have matured, investment managers have been forced to reinvest funds at decreasing rates of return. For pension plans which require significant net cash flow above contributions to fund benefit payments, the risk of insufficient liquidity is another risk component which can create problems if it becomes necessary to sell securities under unfavorable market conditions in order to raise cash necessary to pay retirement benefits. Even for individual securities, insolvency and performance risk can subject a plan to stress if these investments comprise a significant portion of plan assets. Security insolvency or severe underperformance can result in steep increases in sponsor contributions where individual investments comprise more than a de minimis amount of the investment portfolio.

In addition to asset risk, the plan is also subject to risks related to liabilities. These risks include longevity risk (the risk that retirees will live longer than expected), termination risk (the risk that fewer than the anticipated number of members will terminate service prior to retirement), and other factors that may have an impact on the liability structure of the plan. Final average compensation plans are vulnerable to unexpectedly large increases in salary for individual members near retirement. Conversely, in cases where plans have large unfunded liabilities, payroll contraction is a risk insofar as contributions which are typically reported as a percentage of payroll may increase as payrolls decline.

Liability risk also includes items such as data errors. Significant errors in plan data can distort or disguise plan liabilities. When data corrections are made, the plan may experience unexpected increases or decreases in liabilities. Even natural disasters and dislocations in the economy or other unforeseen events can present risks to the plan. These events can affect member payroll and plan demographics, both of which impact costs.

Recommended actuarial contributions are based on expectations related to asset and liability performance; all of the above mentioned factors can produce unexpected changes in the future cost structures of the plan. For this reason, future costs may differ significantly from current levels. Ordinarily, variations in these factors will offset to some extent. However, even with the expectation

that not all variations in costs will likely travel in the same direction, certain factors have the potential on their own accord to pose a significant risk to future cost levels and solvency.

Beyond identifying risk categories, it is possible to quantify some risk factors. One fairly well known risk metric is the funded ratio of the plan. The rate is given as plan assets divided by plan liabilities. However, the definition of each of these terms may vary. The two typical alternatives used for assets are the market and actuarial value of assets. There are a number of alternative measures of liability depending on the funding method employed. The Governmental Accounting Standards Board (GASB) specifies that for financial reporting purposes, the funded ratio is determined by using the market value of assets divided by the entry age normal accrued liability. This value is given in the system's financial report. Alternatively, we have calculated the ratio of the actuarial value of assets to the entry age normal accrued liability based on the funding methodology used to fund the plan. The ratio is 75.82% as of June 30, 2017. This value gives some indication of the financial strength of the plan; however, it does not guarantee the ability of the fund to pay benefits in the future or indicate that in the future, contributions are likely to be less than or greater than current contributions. In addition, the ratio cannot be used in isolation to compare the relative strength of different retirement systems. However, the trend of this ratio over time can give some insight into the financial health of the plan. Even in this regard, caution is warranted since market fluctuations in asset values and changes in plan assumptions can distort underlying trends in this value. One additional risk measure is the sensitivity of the plan's cost structure to asset gains and losses. For this plan, we have determined that based on current assets and demographics, for each percentage under (over) the assumed rate of return on the actuarial value of assets, there will be a corresponding increase (reduction) in the actuarially required contribution as a percentage of projected payroll of 0.72% for the fund.

The ability of a system to recover from adverse asset or liability performance is related to the maturity of the plan population. In general, plans with increasing active membership are less sensitive to asset and liability gains and losses than mature plans since changes in plan costs can be partially allocated to new members. If the plan has a large number of active members compared to retirees, asset or liability losses can be more easily addressed. As more members retire, contributions can only be collected from a smaller segment of the overall plan population. Often, population ratios of actives to annuitants are used to measure the plan's ability to adjust or recover from adverse events since contributions are made by or on behalf of active members but not for retirees. Thus, if the plan suffers a mortality loss through increased longevity, this will affect both actives and retirees, but the system can only fund this loss by contributions related to active members. A measure of risk related to plan maturity is the ratio of total benefit payments to active payroll. For Fiscal 2017, this ratio is 38%; ten years ago this ratio was 29%.

One other area of risk is the risk that plan assumptions will need to be revised to conform to changing actual or expected plan experience. Such assumption revisions could relate to demographic or economic factors. With regard to the economic assumptions, we have determined that a reduction in the valuation interest rate by 1% (without any change to other collateral factors) would increase the actuarially required employer contribution rate for Fiscal 2018 by 16.85% of payroll.

There is a risk that future actuarial measurements may differ significantly from current measurements presented in this report due to factors such as the following: plan experience differing from that anticipated by the economic or demographic assumptions, changes in economic or demographic assumption, completion of amortization payment and credit schedules, and changes in plan provisions or applicable law. Analysis of the effect of all these factors and additional risk metrics is beyond the scope of this report.

CHANGES IN PLAN PROVISIONS

The following changes to the system were enacted during the 2017 Regular Session of the Louisiana Legislature:

Act 17 clarified the definition of earnable compensation to include educational incentive pay, seniority incentive pay, holiday pay, and acting pay as earnable compensation.

Act 21 clarifies that the designation of a beneficiary for optional forms of benefit are irrevocable on and after the date that the first benefit payment becomes due.

Act 22 removes sunset language related to the conversion of retired members or Deferred Retirement Option Plan participants from a service retirement to a service connected disability retirement.

Act 24 states that when the Firefighters' Retirement System reports certain required information to worker's compensation payors by March 31 of each calendar year, the reported amount shall be presumed correct unless the payor gives the system notice otherwise on or before June 30.

ASSET EXPERIENCE

The actuarial and market rates of return for the past ten years are given below. These investment rates of return were determined by assuming a uniform distribution of income and expense throughout the fiscal year.

	<u>Market Value</u>	<u>Actuarial Value</u>
2008	- 5.0%	9.0%
2009	-20.8%	-4.9% *
2010	12.2%	6.1%
2011	17.4%	4.5%
2012	-4.1% †	-0.2% †
2013	10.5%	2.5%
2014	11.4%	8.8%
2015	-0.2%	6.7%
2016	-2.3%	3.1%
2017	13.6%	5.7%

* Includes the effect of a change in the method for calculating the actuarial value of assets. The actuarial value of assets is based on the market value of investment securities adjusted to phase in asset earnings above or below the assumed rate of return over a five-year period with limits set at 85% and 115% of the market value of assets. When the adjusted value falls outside of the limits, the actuarial value is set equal to the average of the limited and adjusted value.

† Based upon asset values which include an unaudited "best estimate" of the value of a receivable related to the FIA Leveraged Fund.

Geometric Average Market Rates of Return

5 year average	(Fiscal 2013 – 2017)	6.4%
10 year average	(Fiscal 2008 – 2017)	2.6%
15 year average	(Fiscal 2003 – 2017)	5.4%
20 year average	(Fiscal 1998 – 2017)	4.8%
25 year average	(Fiscal 1993 – 2017)	5.8%

The market rate of return gives a measure of investment return on a total return basis and includes realized and unrealized capital gains and losses as well as interest income. (Asset and income values for merger notes were excluded from calculations in order to provide a measurement of the return on the portion of the portfolio under management.) This rate of return gives an indication of performance for an actively managed portfolio where securities are bought and sold with the objective of producing the highest total rate of return. During 2017 the fund earned \$17,492,391 of dividends, interest and other recurring income. During the same period, the Fund had net realized and unrealized capital gains on investments and non-recurring income of \$180,257,246. This income was offset by investment expenses of \$7,553,325.

The actuarial rate of return is presented for comparison to the assumed long-term rate of return of 7.5% used for the valuation (7.4% beginning with July 1, 2017). This rate is calculated based on the actuarial value of assets and the market value income adjusted for actuarial smoothing as given in Exhibit VI. Investment income used to calculate this yield is based upon a smoothing of investment income above or below the valuation interest rate over a five year period subject to constraints. The difference between rates of return on an actuarial and market value basis results from the smoothing utilized. Yields in excess of the applicable interest assumption will reduce future costs; yields below the applicable assumption will increase future costs. For Fiscal 2017, the system experienced net actuarial investment earnings of \$27,265,283 below the actuarial assumed earnings rate in effect for fiscal 2017 of 7.50% which produced an actuarial loss and increased the interest-adjusted amortization payments on the system's UAL by \$2,962,015 or 1.24% of projected payroll.

DEMOGRAPHICS AND LIABILITY EXPERIENCE

A reconciliation of the census for the system is given in Exhibit X. The average active contributing member is 38 years old with 11.45 years of service credit and an annual salary of \$52,495. The system's active contributing membership experienced an increase of 67 members during Fiscal 2017. The number of DROP participants remained unchanged during Fiscal 2017. Over the last five years active membership has increased by 373 members. A review of the active census by age indicates that over the last ten years the population in the thirty-one to fifty age group has decreased while the proportion of active members over fifty increased. Over the same ten-year period the system's active census by service remained relatively stable.

The average service retiree is 65 years old with a monthly benefit of \$3,675. The number of retirees and beneficiaries receiving benefits from the system increased by 76 during the fiscal year. Over the last five years, the number has increased by 414; during the same period, the annual benefits in payment increased by \$25,469,411.

The changes in the makeup of the population and changes in members' salaries increased the interest adjusted employer normal cost over the last year by \$2,345,332; the employer normal cost percentage increased by 0.58% of payroll. Plan liability experience for Fiscal 2017 was favorable. Salary increase rates at most durations were less than projected; retirements and withdrawals were near projections. Retiree deaths were above projected levels and DROP entries were below projected levels. These factors tend to reduce costs. Net plan liability experience gains totaled \$13,331,207. These gains decreased the interest-adjusted amortization payments on the system's unfunded accrued liability by \$1,448,261, which corresponds to payments of 0.61% of Fiscal 2018 payroll.

FUNDING ANALYSIS AND RECOMMENDATIONS

Actuarial funding of a retirement system is a process whereby funds are accumulated over the working lifetimes of employees in such a manner as to have sufficient assets available at retirement to pay for the lifetime benefits accrued by each member of the system. The required contributions are determined by an actuarial valuation based on rates of mortality, termination, disability, and retirement, as well as investment return and other statistical measures specific to the particular group. Each year a determination is made of two cost components, and the actuarially required contributions are based on the sum of these two components plus administrative expenses. These two components are the normal cost and the amortization payments on the unfunded actuarial accrued liability. The normal cost refers to the annual cost for active members allocated to each year by the particular cost method utilized. The term unfunded accrued liability (UAL) refers to the excess of the present value of plan benefits over the sum of current assets and future normal costs. Each year the UAL grows with interest and is reduced by payments. In addition it may be increased or diminished by plan experience, changes in assumptions, or changes in benefits including COLA's. Contributions in excess of or less than the actuarially required amount can also decrease or increase the UAL balance. New entrants to the system can also increase or lower costs as a percent of payroll depending upon their demographic distribution. Finally, payroll growth affects plan costs since payments on the system's unfunded liability are on a fixed, level schedule. If payroll increases, these costs are reduced as a percentage of payroll.

In order to establish the actuarially required contribution in any given year, it is necessary to define the assumptions, funding method, and method of amortizing the UAL. Thus, the determination of what contribution is actuarially required depends upon the funding method and amortization schedules employed. Regardless of the method selected, the ultimate cost of providing benefits is dependent upon the benefits, expenses, and investment earnings. Only to the extent that some methods accumulate assets more rapidly and thus produce greater investment earnings does the funding method affect the ultimate cost.

An explanation of the change in costs related to asset and liability gains and losses as well as changes in demographics and assumptions is given in prior sections of the report. In addition to these components, variances in contribution levels and payroll also affect costs. For Fiscal 2017 contributions totaled \$3,496,362 less than required; the interest-adjusted amortization payment on the contribution shortfall for Fiscal 2018 is \$379,834, or 0.16% of Fiscal 2018 projected payroll. In addition, for Fiscal 2018 the net effect of the change in payroll on amortization costs was to reduce such costs by 0.73% of projected payroll.

A reconciliation of the change in costs is given below. Values listed in dollars are interest adjusted for payment throughout the fiscal year. Percentages are based on the projected payroll for Fiscal 2018 except for those items labeled Fiscal 2017.

	Dollars	Percentage of Payroll
Employer Normal Cost for Fiscal 2017	\$ 30,801,348	13.28%
Cost of Demographic and Salary Changes	<u>\$ 2,345,332</u>	<u>0.58%</u>
Employer Normal Cost for Fiscal 2018	\$ 33,146,680	13.86%
UAL Amortization Payments for Fiscal 2017	\$ 55,712,536	24.02%
Change due to change in payroll	N/A	(0.73%)
Change due to Interest Rate Change	\$ (293,376)	(0.12%)

Additional Amortization Expenses for Fiscal 2018:		
Liability Assumption Loss (Gain)	\$ 2,466,936	1.03%
Asset Experience Loss (Gain)	\$ 2,962,015	1.24%
Liability Experience Loss (Gain)	\$ (1,448,261)	(0.61%)
Contribution Loss (Gain)	\$ <u>379,834</u>	<u>0.16%</u>
Total Amortization Expense (Credit) for Fiscal 2018	\$ 59,779,684	24.99%
Estimated Administrative Cost for Fiscal 2018	\$ 1,609,870	0.67%
Total Employer Normal Cost & Amortization Payments	\$ 94,536,234	39.52%

The derivation of the actuarially required contribution for the current fiscal year is given in Exhibit I. The employer normal cost for Fiscal 2018, interest adjusted for mid-year payment is \$33,146,680. The interest adjusted amortization payments on the system's unfunded actuarial accrued liability totaled \$59,779,684. The total actuarially required contribution is determined by summing these two values together with estimated administrative expenses. As given in line 12 of Exhibit I the total actuarially required contribution for Fiscal 2018 is \$94,536,234. We estimate insurance premium taxes of \$25,953,989, or 10.85% of payroll, will be paid to the system in Fiscal 2018. This level of Insurance Premium Taxes represents a 0.06% decrease over the prior year as a percentage of payroll. Hence, the total actuarially required net direct employer contribution for Fiscal 2018 amounts to \$68,582,245 or 28.67% of payroll.

Since the actual employer contribution rate for Fiscal 2018 is 26.50% of payroll, there will be a contribution shortfall of 2.17% of payroll. This shortfall will increase the actuarially required contribution recommended for Fiscal 2019. In order to determine a minimum recommended net direct employer contribution rate for Fiscal 2019, the Employer Normal Cost and Amortization Payments were estimated for Fiscal 2019, adjusted for the impact of the estimated contribution shortfall for Fiscal 2018, the expected change in the valuation interest rate, and the estimated Insurance Premium Taxes for Fiscal 2019. Therefore, as given in line 25 of Exhibit I, the estimated actuarially required net direct employer contribution for Fiscal 2019 is \$64,365,094, or 26.25% of projected payroll (rounded to the nearest 0.25%) for members with earnings greater than the Department of HHS poverty guidelines. For members with earnings less than or equal to the Department of HHS poverty guidelines, employee contributions will be set equal to 8.00% of payroll. The employer contribution rate to be applied to the earnings of such members should be set equal to 28.25% of payroll.

COST OF LIVING INCREASES

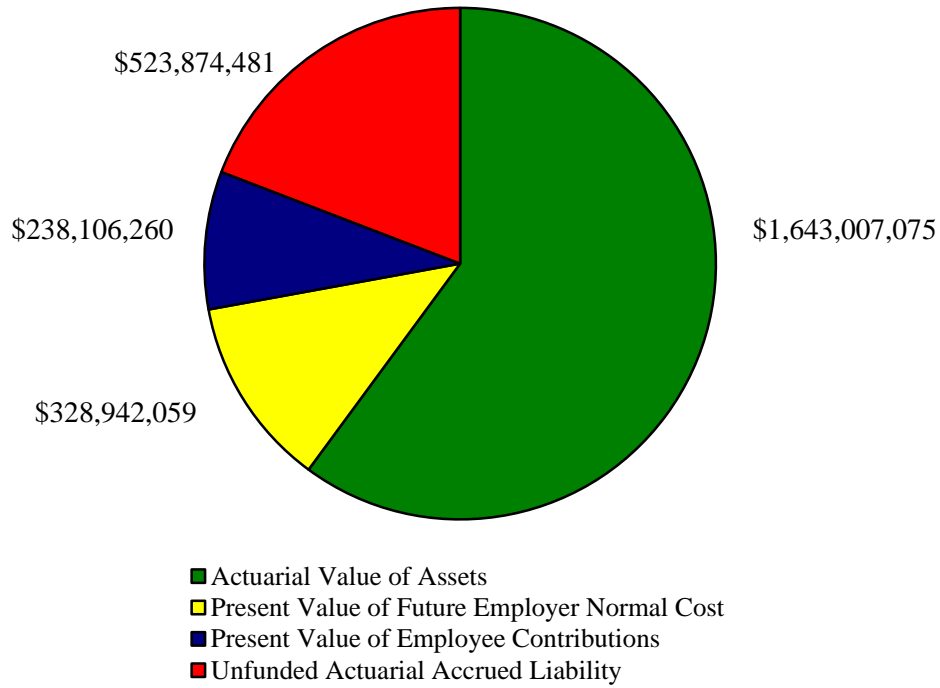
During Fiscal 2017, the actual cost of living (as measured by the US Department of Labor CPI-U) increased by 1.63%. Cost of living provisions for the system are detailed in R.S. 11:2260A(7) and R.S. 11:246. The former statute allows the Board to use interest earnings in excess of the normal requirements to grant annual cost of living increases of up to 3% of each retiree's current benefit. R.S. 11:246 provides cost of living increases to retirees and beneficiaries over the age of 65 equal to 2% of the benefit in payment on October 1, 1977, or the date the benefit was originally received if retirement commenced after that date. In addition, R.S. 11:241 provides that cost of living benefits shall be in the form (unless the Board otherwise specifies) of $\$X \times (A+B)$ where X is at most \$1 and "A" represents the number of years of credited service accrued at retirement or at death of the member or retiree and "B" is equal to the number of years since retirement or since death of the member or retiree to June 30th of the initial year of such increase. The provisions of this subpart do not repeal provisions relative

to cost of living adjustments contained within the individual laws governing systems; however, they are to be controlling in cases of conflict.

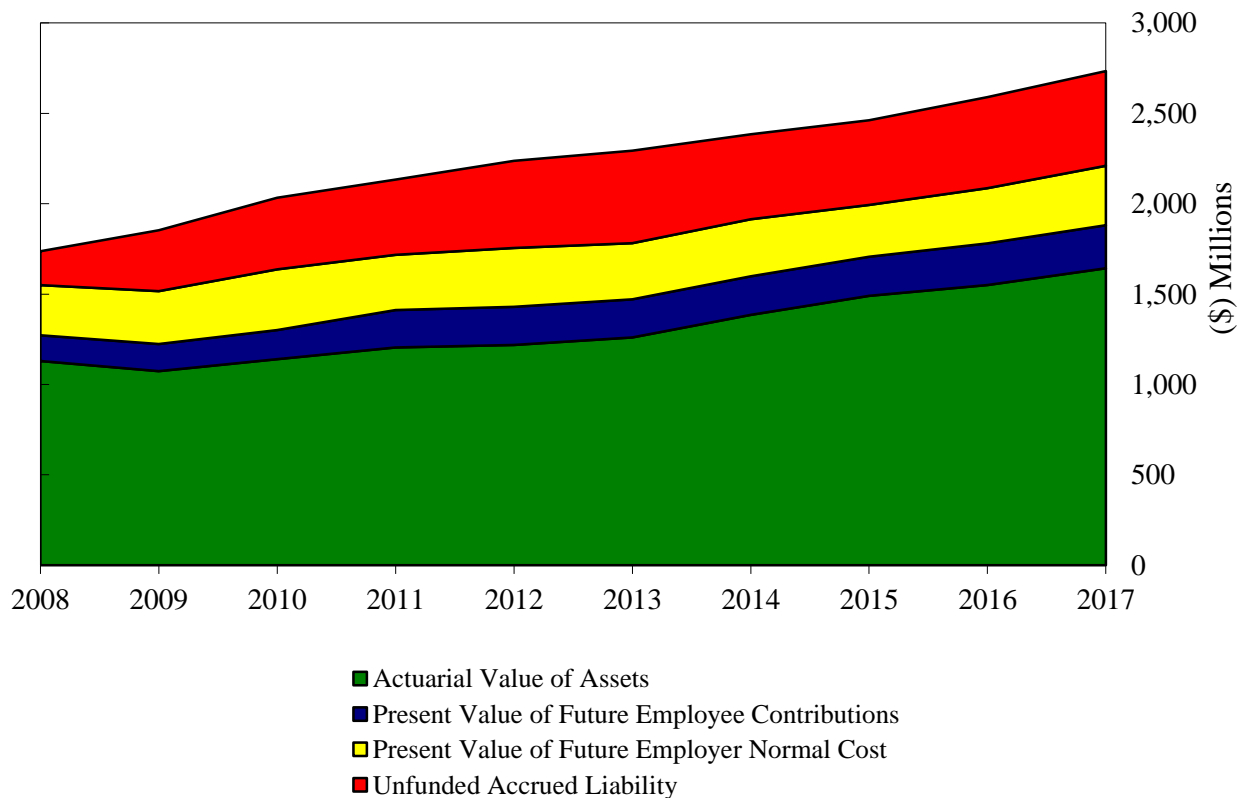
R.S. 11:243 sets forth the funding criteria necessary in order to grant cost of living adjustments to regular retirees and beneficiaries (who are neither the surviving spouse nor children of the retiree.) The criteria for the fund to qualify as eligible to grant any such increase is as follows: a funded ratio of at least 70% if the system has not granted a benefit increase to retirees, survivors, or beneficiaries in any of the three most recent fiscal years; a funded ratio of at least 80% if the system has not granted such an increase in any of the two most recent fiscal years; or a funded ratio of at least 90% if the system has not granted such an increase in the most recent fiscal year. The funded ratio at any fiscal year end is the ratio of the actuarial value of assets to the actuarial accrued liability under the funding method prescribed by the legislative auditor (currently the Projected Unit Credit Method for this system).

With a funded ratio (as measured by the Actuarial Value of Assets divided by the Pension Benefit Obligation) of 78.13% and since the system granted a cost of living increase on January 1, 2015 which is within the three most recent fiscal years, we have determined that for Fiscal 2017 the plan does not meet the criteria set forth in R. S. 11:243 for granting a cost of living increase. In addition, the system failed to earn the 7.50% assumed rate of return on an actuarial basis and therefore has no “excess interest” for the fiscal year.

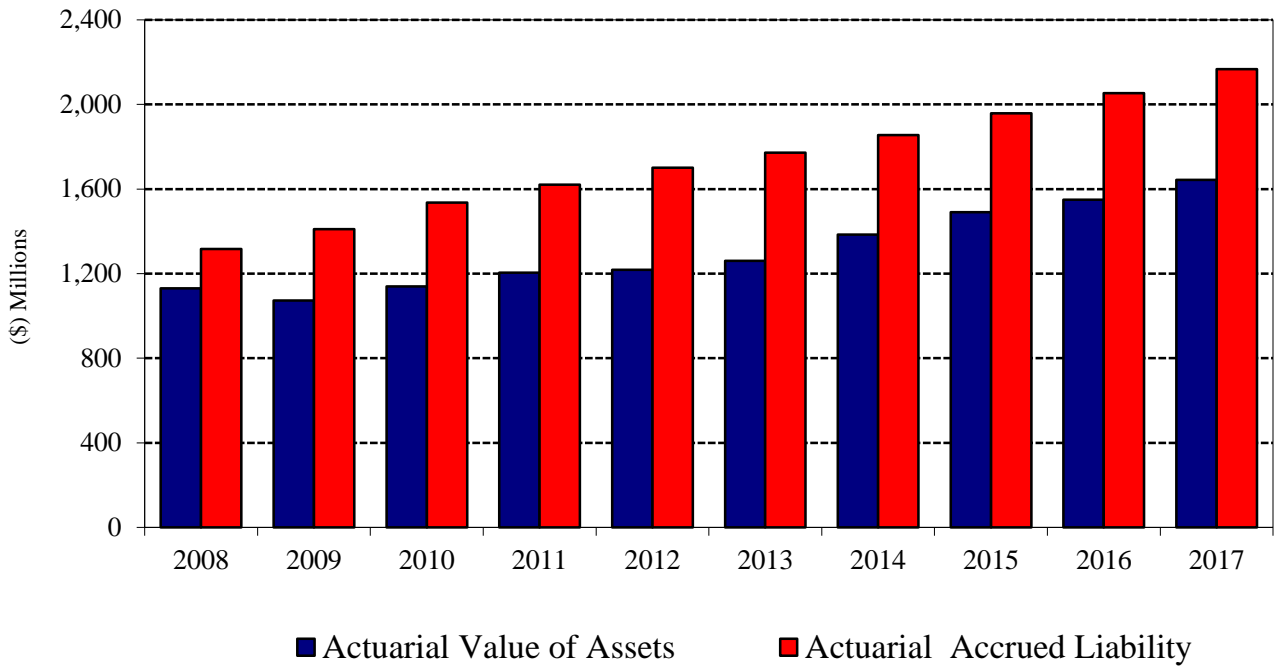
Components of Present Value of Future Benefits June 30, 2017



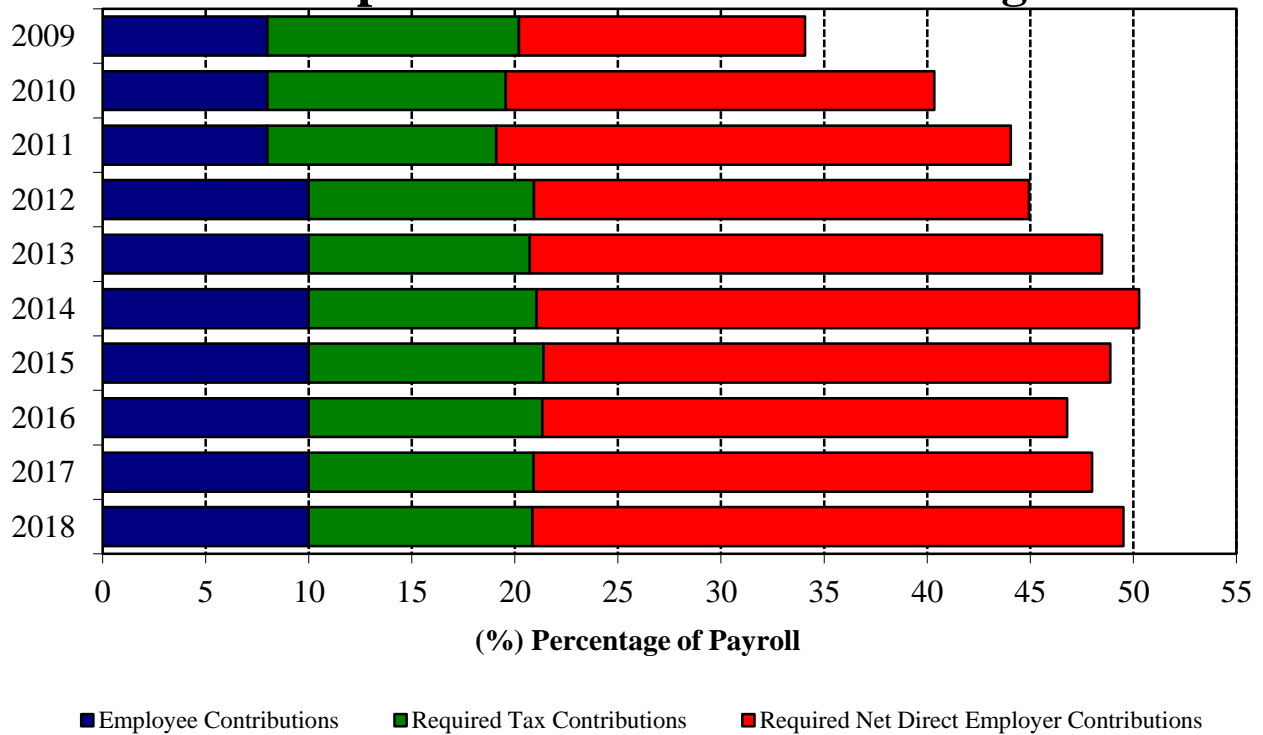
Components of Present Value of Future Benefits Historical



Actuarial Value of Assets vs. Actuarial Accrued Liability

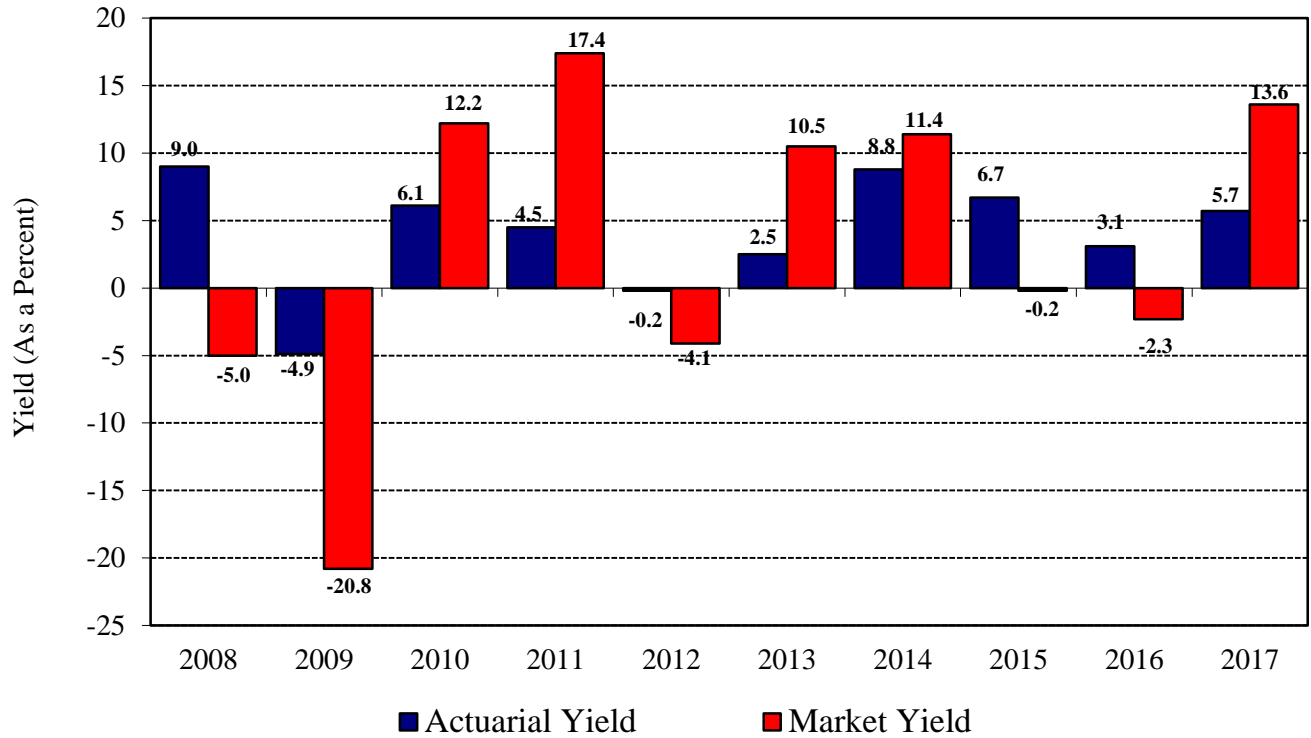


Components of Actuarial Funding

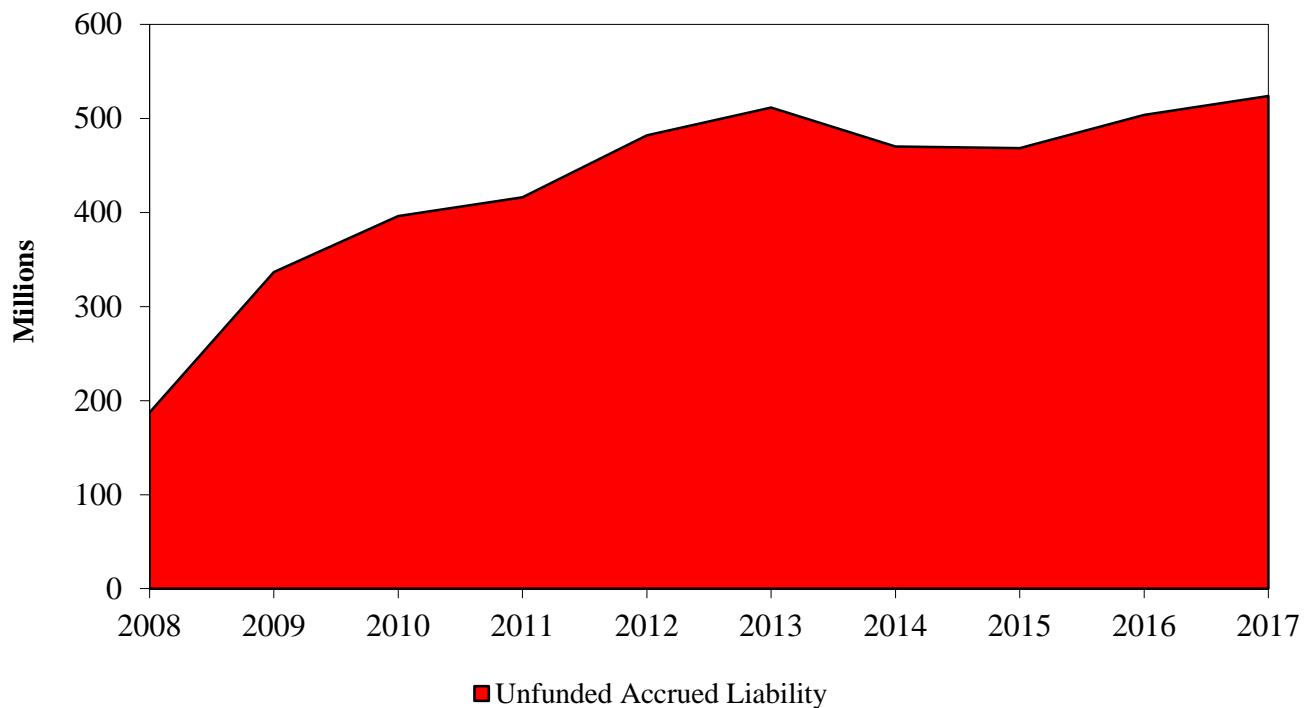


(2012 and later employee contribution level is based on members with earnings above the poverty level)

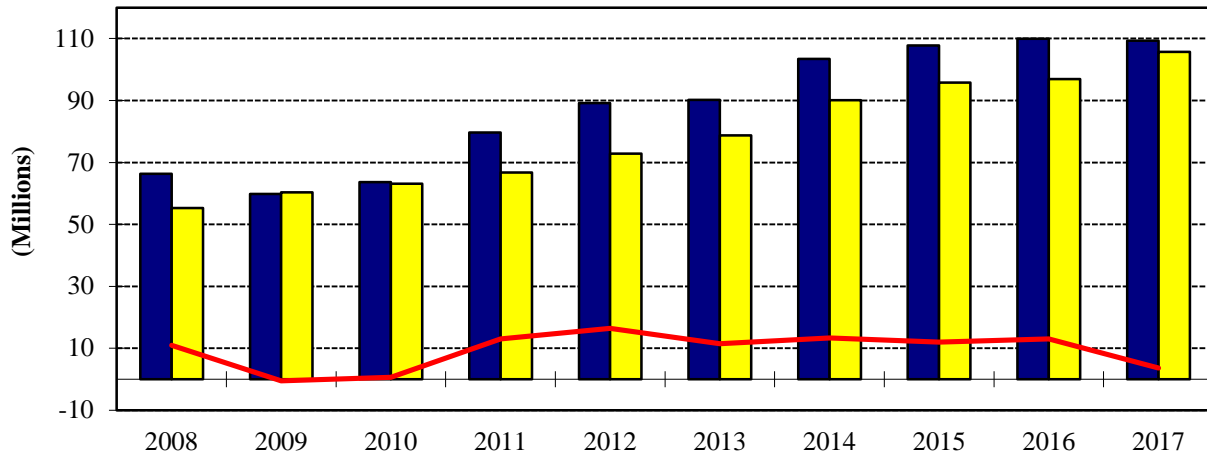
Historical Asset Yields



Unfunded Accrued Liability

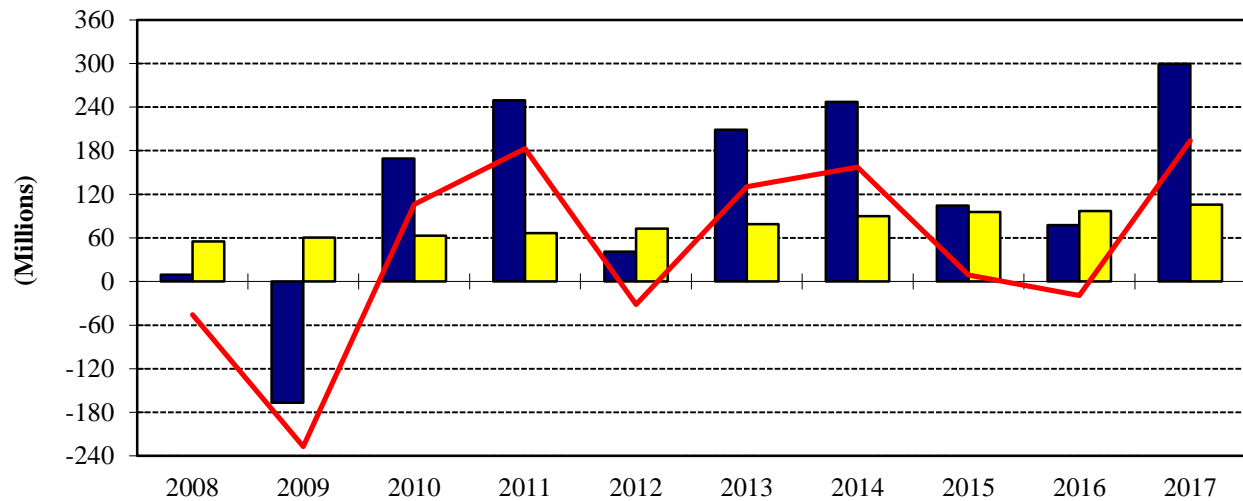


Net Non-Investment Income



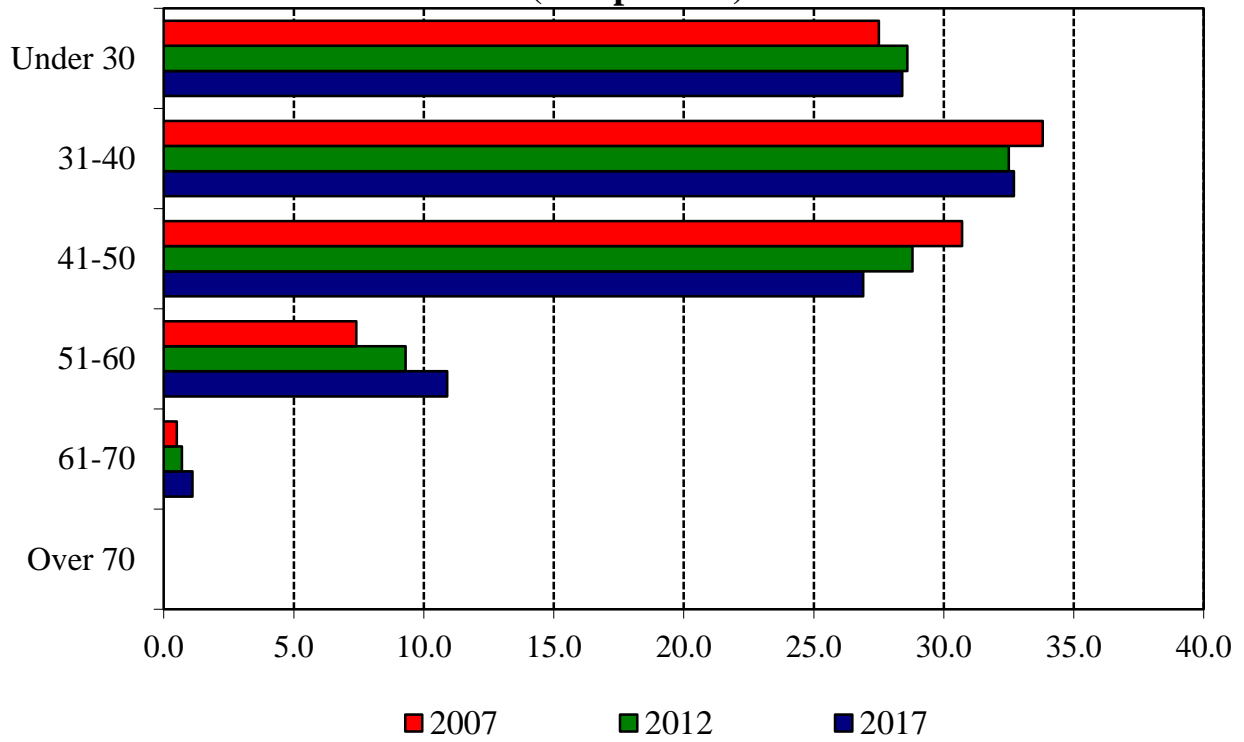
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Non-Investment Income (\$Mil)	■	66.3	59.8	63.7	79.7	89.2	90.2	103.4	107.8	109.9	109.3
Benefits and Expenses (\$Mil)	■	55.3	60.3	63.1	66.7	72.8	78.7	90.1	95.8	96.9	105.7
Net Non-Investment Income (\$Mil)	—	11.0	-0.5	0.6	13.0	16.4	11.5	13.3	12.0	13.0	3.6

Total Income vs. Expenses (Based on Market Value of Assets)



		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Income (\$Mil)	■	9.5	-166.6	169.3	249.4	41.2	209.0	247.2	104.6	77.7	299.5
Benefits and Expenses (\$Mil)	■	55.3	60.3	63.1	66.7	72.8	78.7	90.1	95.8	96.9	105.7
Net Change in MVA (\$Mil)	—	-45.8	-226.9	106.2	182.7	-31.6	130.3	157.1	8.8	-19.2	193.8

Active – Census by Age (as a percent)



Active – Census by Service (as a percent)

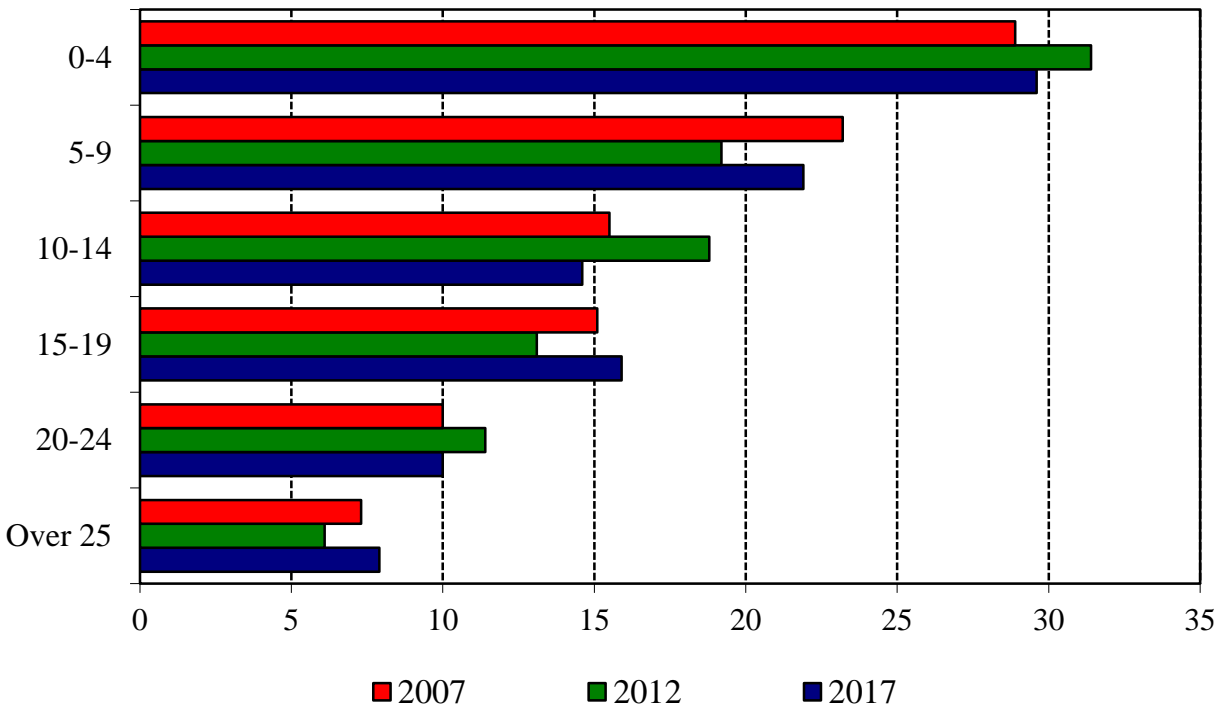


EXHIBIT I
ANALYSIS OF ACTUARIALLY REQUIRED CONTRIBUTIONS

1. Normal Cost of Retirement Benefits.....	\$	48,236,625
2. Normal Cost of Death Benefits	\$	1,554,506
3. Normal Cost of Disability Benefits.....	\$	1,366,258
4. Normal Cost of Deferred Retirement Benefits.....	\$	1,681,543
5. Normal Cost of Contribution Refunds	\$	2,227,180
6. TOTAL Normal Cost as of July 1, 2017 (1+2+3+4+5)	\$	55,066,112
7. TOTAL Normal Cost Interest Adjusted for Mid-year Payment	\$	57,067,199
8. Adjustment to Total Normal Cost for Employee Portion	\$	23,920,519
9. Employer Normal Cost, Adjusted for Midyear Payment (6 – 7)	\$	33,146,680
10. Amortization Payments on Unfunded Accrued Liability at Midyear	\$	59,779,684
11. Projected Administrative Expenses for Fiscal 2018	\$	1,609,870
12. TOTAL Employer Cost (9 + 10 + 11)	\$	94,536,234
13. Expected Insurance Premium Taxes due in Fiscal 2018.....	\$	25,953,989
14. Net Direct Actuarially Required Employer Contribution for Fiscal 2018 (12 – 13)	\$	68,582,245
15. Projected Payroll for Contributing Members (Fiscal 2018)	\$	239,205,188
16. Net Direct Actuarially Required Employer Contribution as a Percentage of Projected Payroll for Fiscal 2018 (14 ÷ 15)		28.67% *
17. Actual Net Direct Employer Contribution Rate for Fiscal 2018.....		26.50% *
18. Projected Fiscal 2018 Contribution Loss (Gain) as a % of Payroll (16 – 17).....		2.17%
19. Projected Fiscal 2018 Employer Contribution Shortfall (Surplus) (15 × 18)	\$	5,190,753
20. Estimated Amortization of Fiscal 2018 Employer Contribution Shortfall (Surplus) Based on Midyear Payment in Fiscal 2019	\$	581,034
21. Estimated Fiscal 2019 Employer Normal Cost Adjusted for Midyear Payment	\$	34,102,556
22. Estimated Fiscal 2019 Amortization Payments based on Fiscal 2018 UAL.....	\$	54,701,172
23. Estimated Fiscal 2019 Administrative Expenses	\$	1,654,544
24. Estimated Insurance Premium Taxes due in Fiscal 2019.....	\$	26,674,212
25. Estimated Actuarially Required Net Direct Employer Contributions for Fiscal 2019 (20 + 21 + 22 + 23 – 24)	\$	64,365,094
26. Projected Payroll for Contributing Members (Fiscal 2019)	\$	246,103,330
27. Minimum Recommended Net Direct Employer Contribution Rate for Fiscal 2019 (25 ÷ 26, Rounded to nearest 0.25%).....		26.25% *

* The above rates are for members with earnings greater than the Department of HHS poverty guidelines. For members with earnings below the poverty guidelines, employer rates will be 2.0% higher and employee rates will be 2.0% lower.

EXHIBIT II
PRESENT VALUE OF FUTURE BENEFITS

PRESENT VALUE OF FUTURE BENEFITS FOR ACTIVE MEMBERS:

Retirement Benefits	\$ 1,595,213,435
Survivor Benefits.....	26,429,483
Disability Benefits.....	19,428,444
Vested Termination Benefits.....	30,958,939
Refunds of Contributions	14,282,126

TOTAL Present Value of Future Benefits for Active Members..... \$ 1,686,312,427

PRESENT VALUE OF FUTURE BENEFITS FOR TERMINATED MEMBERS:

Terminated Vested Members Due Benefits at Retirement..	\$ 13,460,143
Terminated Members with Reciprocal	
Due Benefits at Retirement	0
Terminated Members Due a Refund	3,112,599

TOTAL Present Value of Future Benefits for Terminated Members..... \$ 16,572,742

PRESENT VALUE OF FUTURE BENEFITS FOR RETIREES:

Regular Retirees	
Maximum.....	\$ 232,824,509
Option 1	78,808,292
Option 2	367,476,245
Option 3	147,340,020
Option 4	10,676,571
Option 5	0

TOTAL Regular Retirees..... \$ 837,125,637

Disability Retirees..... 28,762,980

Survivors & Widows..... 64,888,203

DROP Account Balances Payable to Retirees..... 97,430,344

IBO Retirees' Account Balance..... 2,837,542

TOTAL Present Value of Future Benefits for Retirees & Survivors..... \$ 1,031,044,706

TOTAL PRESENT VALUE OF FUTURE BENEFITS..... \$ 2,733,929,875

**EXHIBIT III – SCHEDULE A
MARKET VALUE OF ASSETS**

CURRENT ASSETS:

Cash in Banks	\$ 9,938,516
Contributions and Taxes Receivable.....	7,491,226
Accrued Interest and Dividends.....	6,787,458
Investments Receivable	1,456,025
Prepaid Expenses	2,065

TOTAL CURRENT ASSETS..... \$ 25,675,290

Property Plant & Equipment..... \$ 682,426

INVESTMENTS:

Cash Equivalents.....	\$ 37,575,996
Equities	877,798,403
Fixed Income	337,270,076
Real Estate	120,148,372
Alternative Investments	46,780,469
Tactical Allocation	148,480,317
Derivatives	(623,535)

TOTAL INVESTMENTS..... \$ 1,567,430,098

MERGER NOTES

\$ 2,724,883

TOTAL ASSETS

\$ 1,596,512,697

CURRENT LIABILITIES:

Accounts Payable	\$ 1,445,571
Investments Payable.....	1,370,478

TOTAL CURRENT LIABILITIES

\$ 2,816,049

MARKET VALUE OF ASSETS..... \$ 1,593,696,648

**EXHIBIT III – SCHEDULE B
ACTUARIAL VALUE OF ASSETS**

Excess (Shortfall) of invested income
for current and previous 4 years:

Fiscal year 2017	\$ 85,071,538
Fiscal year 2016	(139,144,339)
Fiscal year 2015	(109,387,912)
Fiscal year 2014	49,370,553
Fiscal year 2013	34,152,321
Total for five years	\$ (79,937,839)

Deferral of excess (shortfall) of invested income:

Fiscal year 2017 (80%)	\$ 68,057,230
Fiscal year 2016 (60%)	(83,486,603)
Fiscal year 2015 (40%)	(43,755,165)
Fiscal year 2014 (20%)	9,874,111
Fiscal year 2013 (0%)	0
Total deferred for year	\$ (49,310,427)

Market value of plan net assets, end of year..... \$ 1,593,696,648

Preliminary actuarial value of plan assets, end of year \$ 1,643,007,075

Actuarial value of assets corridor

85% of market value, end of year	\$ 1,354,642,151
115% of market value, end of year	\$ 1,832,751,145

Final actuarial value of plan net assets, end of year \$ 1,643,007,075

**EXHIBIT IV
PRESENT VALUE OF FUTURE CONTRIBUTIONS**

Employee Contributions to the Annuity Savings Fund	\$ 238,106,260
Employer Normal Contributions to the Pension Accumulation Fund	328,942,059
Employer Amortization Payments to the Pension Accumulation Fund	523,874,481
 TOTAL PRESENT VALUE OF FUTURE CONTRIBUTIONS	 \$ 1,090,922,800

**EXHIBIT V - SCHEDULE A
ACTUARIAL ACCRUED LIABILITIES**

LIABILITY FOR ACTIVE MEMBERS	
Accrued Liability for Retirement Benefits	\$ 1,098,165,277
Accrued Liability for Survivor Benefits	10,480,489
Accrued Liability for Disability Benefits	5,421,383
Accrued Liability for Vested Termination Benefits	13,700,003
Accrued Liability for Refunds of Contributions	(8,503,044)
 TOTAL Actuarial Accrued Liability for Active Members	 \$ 1,119,264,108
 LIABILITY FOR TERMINATED MEMBERS	 \$ 16,572,742
 LIABILITY FOR RETIREES AND SURVIVORS	 \$ 1,031,044,706
 TOTAL ACTUARIAL ACCRUED LIABILITY	 \$ 2,166,881,556
 ACTUARIAL VALUE OF ASSETS	 \$ 1,643,007,075
 UNFUNDED ACTUARIAL ACCRUED LIABILITY	 \$ 523,874,481

**EXHIBIT V - SCHEDULE B
CHANGE IN UNFUNDED ACTUARIAL ACCRUED LIABILITY**

PRIOR YEAR UNFUNDED ACCRUED LIABILITY	\$ 503,720,873
 Interest on Unfunded Accrued Liability	 \$ 37,779,065
Investment Experience Loss	27,265,283
Liability Assumption Loss	22,708,091
Contribution Shortfall with Accrued Interest	3,496,363
 TOTAL Additions to UAL	 \$ 91,248,802
 Liability Experience Gain	 13,331,207
Interest Adjusted Amortization Payments	57,763,987
 TOTAL Reductions to UAL	 \$ 71,095,194
 NET Change in Unfunded Accrued Liability	 \$ 20,153,608
 CURRENT YEAR UNFUNDED ACCRUED LIABILITY	 \$ 523,874,481

EXHIBIT V - SCHEDULE C
AMORTIZATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY - June 30, 2017

<u>FISCAL</u> <u>YEAR</u>	<u>DESCRIPTION</u>	<u>AMORT.</u> <u>PERIOD</u>	<u>INITIAL</u> <u>BALANCE</u>	<u>YEARS</u> <u>REMAINING</u>	<u>REMAINING</u> <u>BALANCE</u>	<u>AMORT.</u> <u>PAYMENTS</u>
1993	Merger Loss (Gain)	30	\$13,485,002	6	\$5,286,394	\$1,045,433
1995	Merger Loss (Gain)	30	41,779,611	8	20,493,630	3,245,261
1996	Merger Loss (Gain)	30	1,772,399	9	948,030	137,798
1997	Merger Loss (Gain)	30	890,324	10	513,082	69,281
1998	Merger Loss (Gain)	30	1,602,435	11	985,365	124,800
1999	Merger Loss (Gain)	30	14,104,876	12	9,181,751	1,099,411
2001	Merger Loss (Gain)	30	3,117,590	14	2,232,114	243,377
2002	Cumulative Non-Merger Bases	27	175,578,584	12	118,322,149	14,167,737
2003	Contribution Loss (Gain)	15	2,678,010	1	281,320	281,320
2003	Assumption Loss (Gain)	15	(3,248,077)	1	(341,205)	(341,205)
2003	Experience Loss (Gain)	15	44,477,780	1	4,672,310	4,672,310
2004	Contribution Loss (Gain)	15	2,129,874	2	432,568	224,001
2004	Experience Loss (Gain)	15	1,570,785	2	319,020	165,201
2005	Experience Loss (Gain)	15	(24,922,321)	3	(7,342,275)	(2,624,075)
2005	Assumption Loss (Gain)	15	(57,207,831)	3	(16,853,792)	(6,023,420)
2005	Contribution Loss (Gain)	15	(2,457,193)	3	(723,905)	(258,718)
2006	Experience Loss (Gain)	15	(30,043,731)	4	(11,399,671)	(3,161,960)
2006	Benefits/COLA Loss (Gain)	15	12,495,729	4	4,741,328	1,315,116
2006	Assumption Loss (Gain)	15	7,880,410	4	2,990,111	829,376
2006	Contribution Loss (Gain)	15	(3,044,474)	4	(1,155,183)	(320,416)
2007	Contribution Loss (Gain)	15	(3,684,696)	5	(1,688,870)	(387,636)
2007	Merger Loss (Gain)	30	1,065,812	20	919,988	83,388
2007	Experience Loss (Gain)	15	(19,348,466)	5	(8,868,314)	(2,035,488)
2007	Benefits/COLA Loss (Gain)	15	13,421,495	5	6,151,704	1,411,962
2008	Assumption Loss (Gain)	15	(138,425)	6	(73,608)	(14,557)
2008	Contribution Loss (Gain)	15	(4,399,499)	6	(2,339,446)	(462,647)
2008	Merger Loss (Gain)	30	1,556,324	21	1,372,246	121,734
2008	Experience Loss (Gain)	15	11,244,458	6	5,979,273	1,182,456
2008	Benefits/COLA Loss (Gain)	15	15,006,752	6	7,979,884	1,578,095
2009	Asset Assumption Loss (Gain)	15	(121,695,690)	7	(73,021,956)	(12,792,365)
2009	Asset Experience Loss (Gain)	20	261,874,151	12	198,702,354	23,792,356
2009	COLA Loss (Gain)	20	15,784,880	12	11,977,100	1,434,122
2009	Experience Loss (Gain)	20	(3,921,422)	12	(2,975,459)	(356,278)
2009	Contribution Loss (Gain)	20	993,536	12	753,866	90,267
2010	Liability Assumption Loss(Gain)	15	37,843,942	8	25,111,640	3,976,545
2010	Asset Experience Loss (Gain)	19	14,930,089	12	11,596,293	1,388,525
2010	Experience Loss (Gain)	19	985,441	12	765,398	91,648
2010	Contribution Loss (Gain)	19	11,264,571	12	8,749,263	1,047,625
2011	Merger Loss (Gain)	30	329,132	24	306,073	25,726
2011	Asset Experience Loss (Gain)	18	34,204,316	12	27,259,392	3,264,003
2011	Experience Loss (Gain)	18	(13,197,519)	12	(10,517,864)	(1,259,395)
2011	Contribution Loss (Gain)	18	6,777,563	12	5,401,431	646,760
2012	Asset Experience Loss (Gain)	17	93,583,915	12	76,733,169	9,187,928
2012	Experience Loss (Gain)	17	(21,072,289)	12	(17,278,007)	(2,068,846)

<u>FISCAL</u> <u>YEAR</u>	<u>DESCRIPTION</u>	<u>AMORT.</u> <u>PERIOD</u>	<u>INITIAL</u> <u>BALANCE</u>	<u>YEARS</u> <u>REMAINING</u>	<u>REMAINING</u> <u>BALANCE</u>	<u>AMORT.</u> <u>PAYMENTS</u>
2012	Contribution Loss (Gain)	17	2,867,982	12	2,351,572	281,574
2013	Asset Experience Loss (Gain)	16	61,647,815	12	52,164,596	6,246,119
2013	Experience Loss (Gain)	16	(30,226,604)	12	(25,576,877)	(3,062,541)
2013	Contribution Loss (Gain)	16	9,431,584	12	7,980,733	955,602
2013	Assumption Loss (Gain)	15	1,290,257	11	1,069,293	135,430
2014	Asset Experience Loss (Gain)	15	(16,528,266)	12	(14,483,857)	(1,734,278)
2014	Experience Loss (Gain)	15	(12,708,035)	12	(11,136,156)	(1,333,429)
2014	Contribution Loss (Gain)	15	3,117,549	12	2,731,935	327,118
2014	Liability Assumption Loss (Gain)	15	(318,965)	12	(279,510)	(33,468)
2015	Asset Experience Loss (Gain)	15	11,058,278	13	10,179,741	1,159,940
2015	Experience Loss (Gain)	15	(18,187,590)	13	(16,742,659)	(1,907,758)
2015	Contribution Loss (Gain)	15	(5,158,272)	13	(4,748,467)	(541,069)
2015	Liability Assumption Loss (Gain)	15	7,891,805	13	7,264,832	827,798
2015	COLA Loss	15	17,767,886	13	16,356,297	1,863,734
2016	Asset Experience Loss (Gain)	15	65,389,778	14	62,886,184	6,856,766
2016	Experience Loss (Gain)	15	(6,578,348)	14	(6,326,481)	(689,805)
2016	Contribution Loss (Gain)	15	(6,794,080)	14	(6,533,953)	(712,427)
2017	Liability Assumption Loss (Gain)	15	22,708,091	15	22,708,091	2,380,432
2017	Asset Experience Loss (Gain)	15	27,265,283	15	27,265,283	2,858,151
2017	Experience Loss (Gain)	15	(13,331,207)	15	(13,331,207)	(1,397,477)
2017	Contribution Loss (Gain)	15	3,496,362	15	3,496,362	366,515

TOTAL Unfunded Actuarial Accrued Liability	\$ 523,874,481*
TOTAL Fiscal 2018 Amortization Payments at Beginning of Year	\$ 57,683,483
TOTAL Fiscal 2018 Amortization Payments Adjusted to Mid-Year	\$ 59,779,684

* Does not equal sum of remaining balances due to rounding.

EXHIBIT VI
ANALYSIS OF CHANGE IN ASSETS

Actuarial Value of Assets (June 30, 2016)		\$ 1,550,261,745
INCOME:		
Member Contributions	\$ 23,404,268	
Employer Contributions	59,091,498	
Irregular Contributions	1,509,479	
Insurance Premium Taxes	25,310,647	
Total Contributions		\$ 109,315,892
Net Appreciation of Investments	\$ 178,584,542	
Interest & Dividends	17,492,391	
Legal Settlement	1,672,704	
Investment Expense	(7,553,325)	
Net Investment Income		\$ 190,196,312
TOTAL Income		\$ 299,512,204
EXPENSES:		
Retirement Benefits	\$ 102,768,682	
Refunds of Contributions	1,467,175	
Administrative Expenses	1,471,911	
TOTAL Expenses		\$ 105,707,768
Net Market Value Income for Fiscal 2017 (Income - Expenses)		\$ 193,804,436
Unadjusted Assets as of June 30, 2017 (Assets Previous Year + Net Income)		\$ 1,744,066,181
Adjustment for Actuarial Smoothing		\$ (101,059,106)
Actuarial Value of Assets: (June 30, 2017)		\$ 1,643,007,075

EXHIBIT VII
PENSION BENEFIT OBLIGATION

Present Value of Credited Projected Benefits Payable to Current Employees.....	\$ 1,055,217,326
Present Value of Benefits Payable to Terminated Employees	16,572,742
Present Value of Benefits Payable to Current Retirees and Beneficiaries	1,031,044,706
 TOTAL PENSION BENEFIT OBLIGATION	 \$ 2,102,834,774
 NET ACTUARIAL VALUE OF ASSETS	 \$ 1,643,007,075
 Ratio of Net Actuarial Value of Assets to Pension Benefit Obligation.....	 78.13%

**EXHIBIT VIII
CENSUS DATA**

	Active	Terminated with Funds on Deposit	DROP	Retired	Total
Number of members as of June 30, 2016	4,362	630	173	2,213	7,378
Additions to Census					
Initial membership	308	31			339
Omitted in error last year					
Death of another member				28	28
Adjustment for multiple records	1			3	4
Change in Status during Year					
Actives terminating service	(93)	93			
Actives who retired	(52)			52	
Actives entering DROP	(61)		61		
Term. members rehired	24	(24)			
Term. members who retire		(8)		8	
Retirees who are rehired					
Refunded who are rehired	2				2
DROP participants retiring			(46)	46	
DROP returned to work	15		(15)		
Omitted in error last year					
Eliminated from Census					
Refund of contributions	(73)	(53)			(126)
Deaths	(4)			(60)	(64)
Included in error last year				(1)	(1)
Adjustment for multiple records					
Number of members as of June 30, 2017	4,429	669	173	2,289	7,560

ACTIVES CENSUS BY AGE:

Age	Number Male	Number Female	Total Number	Average Salary	Total Salary
16 - 20	22	0	22	33,643	740,147
21 - 25	436	17	453	36,103	16,354,808
26 - 30	750	34	784	41,026	32,164,217
31 - 35	741	36	777	45,962	35,712,604
36 - 40	617	53	670	52,098	34,905,750
41 - 45	597	28	625	60,293	37,683,080
46 - 50	517	48	565	65,001	36,725,379
51 - 55	306	31	337	70,313	23,695,578
56 - 60	122	23	145	71,274	10,334,719
61 - 65	33	8	41	78,796	3,230,654
66 - 70	9	0	9	96,105	864,942
71 - 75	1	0	1	88,519	88,519
TOTAL	4,151	278	4,429	52,495	232,500,397

THE ACTIVE CENSUS INCLUDES 1,858 ACTIVES WITH VESTED BENEFITS, INCLUDING 65 ACTIVE FORMER DROP PARTICIPANTS. THE 173 CURRENT DROP PARTICIPANTS ARE EXCLUDED.

DROP PARTICIPANTS:

Age	Number Male	Number Female	Total Number	Average Benefit	Total Benefit
41 - 45	1	0	1	65,913	65,913
46 - 50	15	1	16	52,562	840,987
51 - 55	94	4	98	60,502	5,929,231
56 - 60	43	2	45	64,477	2,901,467
61 - 65	10	1	11	61,148	672,630
66 - 70	1	1	2	38,639	77,278
TOTAL	164	9	173	60,621	10,487,506

TERMINATED MEMBERS DUE A DEFERRED RETIREMENT BENEFIT:

Age	Number Male	Number Female	Total Number	Average Benefit	Total Benefit
31 - 35	2	0	2	18,287	36,574
36 - 40	7	2	9	23,858	214,726
41 - 45	15	0	15	22,652	339,783
46 - 50	26	1	27	26,098	704,649
51 - 55	18	1	19	30,831	585,793
TOTAL	68	4	72	26,132	1,881,525

TERMINATED MEMBERS DUE A REFUND OF CONTRIBUTIONS:

Contributions Ranging From To	Number	Total Contributions
0 - 99	60	3,035
100 - 499	157	40,873
500 - 999	62	43,686
1000 - 1999	59	83,012
2000 - 4999	89	284,109
5000 - 9999	74	532,845
10000 - 19999	46	661,548
20000 - 99999	50	1,463,491
TOTAL	597	3,112,599

REGULAR RETIREES:

Age	Number Male	Number Female	Total Number	Average Benefit	Total Benefit
41 - 45	1	0	1	46,643	46,643
46 - 50	29	2	31	45,290	1,403,993
51 - 55	198	6	204	48,709	9,936,552
56 - 60	375	18	393	50,708	19,928,079
61 - 65	347	14	361	46,933	16,942,885
66 - 70	338	4	342	42,194	14,430,379
71 - 75	208	6	214	37,117	7,943,125
76 - 80	123	2	125	36,640	4,579,958
81 - 85	50	0	50	30,361	1,518,055
86 - 90	35	0	35	26,154	915,398
91 - 99	13	0	13	28,829	374,771
TOTAL	1,717	52	1,769	44,104	78,019,838

DISABILITY RETIREES:

Age	Number Male	Number Female	Total Number	Average Benefit	Total Benefit
36 - 40	4	1	5	22,507	112,535
41 - 45	5	2	7	26,396	184,773
46 - 50	22	0	22	24,152	531,350
51 - 55	18	3	21	22,782	478,426
56 - 60	21	3	24	23,513	564,305
61 - 65	19	1	20	19,983	399,651
66 - 70	16	1	17	22,133	376,256
71 - 75	10	0	10	17,435	174,354
76 - 80	6	0	6	11,839	71,033
81 - 85	6	0	6	17,609	105,655
86 - 90	2	0	2	11,764	23,527
91 - 99	1	0	1	13,830	13,830
TOTAL	130	11	141	21,530	3,035,695

SURVIVORS:

Age	Number Male	Number Female	Total Number	Average Benefit	Total Benefit
0 - 25	18	22	40	4,982	199,270
26 - 30	0	1	1	22,222	22,222
31 - 35	1	3	4	25,708	102,831
36 - 40	1	5	6	18,126	108,755
41 - 45	1	7	8	23,502	188,014
46 - 50	0	9	9	25,062	225,555
51 - 55	0	20	20	25,962	519,236
56 - 60	0	28	28	28,509	798,251
61 - 65	3	27	30	27,030	810,896
66 - 70	0	44	44	20,994	923,751
71 - 75	1	38	39	20,816	811,843
76 - 80	0	51	51	19,820	1,010,827
81 - 85	0	45	45	19,203	864,145
86 - 90	0	45	45	15,027	676,216
91 - 99	0	9	9	14,149	127,340
TOTAL	25	354	379	19,496	7,389,152

ACTIVE MEMBERS:

Attained Ages	Completed Years of Service											Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30&Over	
0 - 20	19	2	1									22
21 - 25	127	132	80	56	34	24						453
26 - 30	89	108	84	79	88	317	19					784
31 - 35	45	41	50	41	49	322	208	21				777
36 - 40	18	23	18	23	21	146	220	197	4			670
41 - 45	5	8	7	6	9	92	91	245	156	6		625
46 - 50	6	9	11	6	7	37	55	131	198	103	2	565
51 - 55		3	1	4	3	22	32	65	63	117	27	337
56 - 60						11	20	28	17	42	27	145
61 - 65							3	14	4	11	9	41
66 - 70									2	1	4	9
71 & Over								2			1	1
Totals	309	326	252	215	211	971	648	703	444	280	70	4429

AVERAGE ANNUAL SALARY OF ACTIVE MEMBERS:

Attained Ages	Completed Years of Service											Average Salary
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30&Over	
0 - 20	33,822	31,193	35,147									33,643
21 - 25	31,075	35,269	38,510	40,141	41,143	42,717						36,103
26 - 30	33,108	35,330	40,359	39,678	42,143	44,982	47,853					41,026
31 - 35	35,372	35,778	39,290	39,999	42,947	46,415	52,241	53,972				45,962
36 - 40	34,020	37,307	41,909	39,929	43,298	47,966	54,715	58,684	63,053			52,098
41 - 45	34,797	41,892	38,901	40,199	45,480	49,271	55,940	62,233	70,149	72,911		60,293
46 - 50	40,249	35,490	41,487	44,170	48,072	50,037	55,013	64,738	70,362	74,535	69,976	65,001
51 - 55	45,876	45,876	46,612	33,964	36,243	48,754	56,748	68,133	73,859	74,761	94,426	70,313
56 - 60						54,862	62,903	68,063	78,100	75,063	83,885	71,274
61 - 65								67,500	70,256	92,125	89,172	78,796
66 - 70								71,039	79,038	168,924	98,966	96,105
71 & Over											88,519	88,519
Average	32,865	35,738	39,684	39,920	42,539	46,646	54,033	62,366	71,052	75,702	89,161	52,495

TERMINATED MEMBERS DUE A DEFERRED RETIREMENT BENEFIT:

Attained Ages	Years Until Retirement Eligibility										Total	
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29		30&Over
0 - 30												0
31 - 35									2			2
36 - 40								9				9
41 - 45							15					15
46 - 50				2		25						27
51 - 55	2	1	3	9	4							19
56 & Over												0
Totals	2	1	3	11	4	25	15	9	2	0	0	72

AVERAGE ANNUAL BENEFITS OF TERMINATED MEMBERS DUE A DEFERRED RETIREMENT BENEFIT:

Attained Ages	Years Until Retirement Eligibility										Average Benefit	
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29		30&Over
0 - 30												0
31 - 35									18,287			18,287
36 - 40								23,858				23,858
41 - 45							22,652					22,652
46 - 50				42,567		24,781						26,098
51 - 55	62,403	29,138	28,138	24,509	31,714							30,831
56 & Over												0
Average	62,403	29,138	28,138	27,792	31,714	24,781	22,652	23,858	18,287	0	0	26,132

SERVICE RETIREES:

Attained Ages	Completed Years Since Retirement											Total			
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30&Over				
0 - 50	14	7	4	5	1	1									32
51 - 55	41	35	28	22	27	43	8								204
56 - 60	33	28	45	50	44	145	47	1							393
61 - 65	8	16	22	28	16	115	124	26	6						361
66 - 70	1	2	2	6	11	53	108	127	20	9	3				342
71 - 75	1				1	16	28	75	66	12	15				214
76 - 80						3	8	22	39	28	25				125
81 - 85							1	1	4	12	32				50
86 - 90								1	3	6	25				35
91 & Over								1		2	11				13
Totals	98	88	101	111	100	376	324	253	138	69	111				1769

AVERAGE ANNUAL BENEFITS PAYABLE TO SERVICE RETIREES:

Attained Ages	Completed Years Since Retirement											Average Benefit			
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30&Over				
0 - 50	46,942	44,762	47,332	42,264	32,776	46,689									45,332
51 - 55	49,136	50,586	56,098	49,611	43,513	46,819	37,648								48,709
56 - 60	59,626	55,165	50,685	56,531	57,459	47,589	39,215	36,710							50,708
61 - 65	67,652	46,259	51,101	62,829	59,212	46,566	43,314	36,915	24,131						46,933
66 - 70	112,829	101,421	25,946	40,275	45,381	49,738	44,203	39,348	30,903	24,221	26,247				42,194
71 - 75	19,580				39,875	36,582	38,374	41,526	37,040	25,564	23,867				37,117
76 - 80						40,364	46,342	37,297	45,465	33,374	22,400				36,640
81 - 85							19,390	74,461	46,335	37,269	24,739				30,361
86 - 90								6,128	39,399	35,994	23,004				26,154
91 & Over										49,243	25,117				28,829
Average	54,215	51,948	51,654	55,227	52,223	46,963	42,450	39,562	38,291	32,187	23,782				44,104

DISABILITY RETIREES:

Attained Ages	Completed Years Since Retirement											Total					
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30&Over						
0 - 35																	0
36 - 40		2					1										5
41 - 45	2	1	1				2										7
46 - 50	1	2		3			7		1								22
51 - 55				1	1		6		2								21
56 - 60		3		1			1		3								24
61 - 65							1		4							5	20
66 - 70							1		3							6	17
71 - 75							2		4							6	10
76 - 80									2							3	6
81 - 85																2	6
86 - 90																1	2
91 & Over																1	1
Totals	3	8	1	6	3	18	23	22	15	21	21	21	15	21	21	141	

AVERAGE ANNUAL BENEFITS PAYABLE TO DISABILITY RETIREES:

Attained Ages	Completed Years Since Retirement											Average Benefit						
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30&Over							
0 - 35																		0
36 - 40		30,233		27,451		9,574	15,044											22,507
41 - 45	26,757	33,755	32,640		29,789	17,538												26,396
46 - 50	11,746	22,286		48,589	30,851	25,860	15,641	10,312	18,561									24,152
51 - 55				26,880	9,416	29,714	23,821	17,636	16,370									22,782
56 - 60				26,387		19,788	31,993	20,619	11,573									23,513
61 - 65		39,382				42,439	24,817	14,189	20,076									19,983
66 - 70							30,361	26,417	20,404									22,133
71 - 75								11,668										17,435
76 - 80								9,396										13,060
81 - 85									36,337									11,839
86 - 90																		17,609
91 & Over																		11,763
Average	21,753	32,117	32,640	37,748	23,352	25,899	24,492	16,528	18,952	18,384	15,280	15,280	18,952	18,384	15,280	21,530		

SURVIVING BENEFICIARIES OF FORMER MEMBERS:

Completed Years Since Retirement

Attained Ages	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30&Over	Total
0 - 20	2		4	3		13	6	1	2			31
21 - 25						5		2	2			9
26 - 30			1									1
31 - 35	2			1		1						4
36 - 40						4			1			6
41 - 45						1	3	2		1		8
46 - 50						4	2		2			9
51 - 55			1	1	1	8	1	4	3	1		20
56 - 60		1	1	1	1	8	8	4	2	8	2	28
61 - 65	1		1	1	1	4	6	6	1		3	30
66 - 70	1		1	2		1	5	14	12	2	6	44
71 - 75							3	11	9	4	12	39
76 - 80						1	1	9	3	13	24	51
81 - 85								3	4	11	27	45
86 - 90									2	2	41	45
91 & Over										1	8	9
Totals	6	1	8	12	2	50	35	56	43	43	123	379

AVERAGE ANNUAL BENEFITS PAYABLE TO SURVIVORS OF FORMER MEMBERS:

Completed Years Since Retirement

Attained Ages	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30&Over	Average Benefit
0 - 20	6,175		5,459	5,874		5,195	3,959	3,756	5,836			5,114
21 - 25						5,315		3,009	4,075			4,527
26 - 30			22,222									22,222
31 - 35	28,433			32,146		13,820			35,014	1,791		25,708
36 - 40						17,987						18,126
41 - 45						27,967	21,687	14,628				23,502
46 - 50						33,740	17,675		11,852			25,062
51 - 55			34,468	48,685	87,798	29,391	16,885	13,772	10,496	9,691		25,962
56 - 60		60,900	58,647	23,828	42,895	31,529	27,953	17,944	22,579			28,509
61 - 65	86,771			27,230		31,196	28,126	21,819	43,133	22,313		27,030
66 - 70	15,421		64,092	19,679		11,751	22,313	21,130	23,583	16,822		20,994
71 - 75						40,219	40,219	23,152	25,515	19,800		20,816
76 - 80						27,789	46,572	23,104	28,392	28,407		19,820
81 - 85								5,378	38,570	25,719		19,203
86 - 90									21,307	17,063		15,027
91 & Over										36,032	11,413	14,149
Average	28,568	60,900	25,158	23,845	65,346	19,890	23,206	19,132	23,094	23,841	13,353	19,496

EXHIBIT IX YEAR-TO-YEAR COMPARISON

	Fiscal 2017	Fiscal 2016	Fiscal 2015	Fiscal 2014
Number of Active Members	4,429	4,362	4,192	4,098
Number of Retirees & Survivors	2,289	2,213	2,139	2,057
DROP Participants	173	173	166	185
Number of Terminated Due Deferred Benefits	72	72	81	9
Number Terminated Due Refunds	597	558	523	472
Active Lives Payroll (excludes DROP participants)	\$ 232,500,397	\$ 225,301,112	\$ 211,963,892	\$ 203,333,976
Retiree Benefits in Payment	\$ 88,444,685	\$ 83,899,034	\$ 79,924,818	\$ 73,404,453
Market Value of Assets	\$ 1,593,696,648	\$ 1,399,892,212	\$ 1,419,138,769	\$ 1,410,307,198
Ratio of Actuarial Value of Assets to Actuarial Accrued Liability	75.82%	75.48%	76.09%	74.66%
Actuarial Accrued Liability (EAN)	\$ 2,166,881,556	\$ 2,053,982,618	\$ 1,958,850,006	\$ 1,855,298,538
Actuarial Value of Assets	\$ 1,643,007,075	\$ 1,550,261,745	\$ 1,490,408,510	\$ 1,385,135,204
UAL (Funding Excess)	\$ 523,874,481	\$ 503,720,873	\$ 468,441,496	\$ 470,163,334
P.V. of Future Employer Normal Contributions	\$ 328,942,059	\$ 305,570,473	\$ 286,640,979	\$ 315,734,786
Present Value of Future Employee Contrib.	\$ 238,106,260	\$ 230,423,085	\$ 216,351,986	\$ 213,279,261
Present Value of Future Benefits	\$ 2,733,929,875	\$ 2,589,976,176	\$ 2,461,842,971	\$ 2,384,312,585
	Fiscal 2018	Fiscal 2017	Fiscal 2016	Fiscal 2015
Employee Contribution Rate Above Poverty Level	10.00%	10.00%	10.00%	10.00%
Insurance Premium Tax Contributions as a Percentage of Projected Payroll	10.85%	10.91%	11.33%	11.39%
Actuarially Required Employer Contribution as a Percentage of Projected Payroll	28.67%	27.09%	25.44%	27.50%
Actual Employer Contribution as a Percentage of Projected Payroll	26.50%	25.25%	27.25%	29.25%

* The above rates are for members with earnings greater than the Department of HHS poverty guidelines. For members with earnings below the poverty guidelines, employer rates will be 2.0% higher and employee rates will be 2.0% lower.

Fiscal 2013	Fiscal 2012	Fiscal 2011	Fiscal 2010	Fiscal 2009	Fiscal 2008
4,063	4,056	4,020	3,989	3,882	3,821
1,958	1,875	1,802	1,749	1,688	1,631
221	217	225	162	147	130
71	70	68	59	55	55
450	398	418	442	407	350
\$ 199,129,982	\$ 198,112,999	\$ 193,136,985	\$ 189,542,210	\$ 178,913,097	\$ 169,401,716
\$ 67,678,016	\$ 62,975,274	\$ 58,699,965	\$ 56,056,554	\$ 53,031,851	\$ 48,416,581
\$ 1,253,213,084	\$ 1,122,864,548	\$ 1,154,482,040	\$ 971,775,080	\$ 865,547,030	\$ 1,092,459,674
71.13%	71.66%	74.33%	74.21%	76.13%	85.78%
\$ 1,771,931,777	\$ 1,700,643,083	\$ 1,621,007,988	\$ 1,536,258,543	\$ 1,410,559,615	\$ 1,317,161,382
\$ 1,260,348,240	\$ 1,218,618,308	\$ 1,204,830,245	\$ 1,140,054,175	\$ 1,073,797,423	\$ 1,129,809,421
\$ 511,583,537	\$ 482,024,775	\$ 416,177,743	\$ 396,204,368	\$ 336,762,192	\$ 187,351,961
\$ 310,702,226	\$ 325,616,184	\$ 305,540,215	\$ 335,984,027	\$ 292,585,945	\$ 277,566,364
\$ 210,842,508	\$ 211,015,125	\$ 206,989,105	\$ 160,939,180	\$ 150,094,699	\$ 142,412,175
\$ 2,294,778,794	\$ 2,223,486,329	\$ 2,133,537,308	\$ 2,033,181,750	\$ 1,853,240,259	\$ 1,737,139,921

Fiscal 2014	Fiscal 2013	Fiscal 2012	Fiscal 2011	Fiscal 2010	Fiscal 2009
10.00%	10.00%	10.00%	8.00%	8.00%	8.00%
11.05%	10.72%	10.93%	11.09%	11.56%	12.20%
29.23%	27.77%	24.02%	24.97%	20.79%	13.89%
28.25%	24.00%	23.25%	21.50%	14.00%	12.50%

SUMMARY OF PRINCIPAL PLAN PROVISIONS

The Firefighters' Retirement System was established as of January 1, 1980, for the purpose of providing retirement allowances and other benefits as described under R.S. 11:2256 - 11:2259. The following summary of plan provisions is for general informational purposes only and does not constitute a guarantee of benefits.

MEMBERSHIP - All full time firefighters or any person in a position as defined in the municipal fire and police civil service system who is employed by a fire department of any municipality, parish, or fire protection district of the State of Louisiana, except Orleans, and East Baton Rouge Parishes, who earns at least three hundred seventy-five dollars per month excluding state supplemental pay are required to be members of this retirement system. Employees of the system are eligible, at their option to become members of the system. Persons must be under the age of fifty to be eligible for system membership unless they become members through merger.

CONTRIBUTION RATES - Under the provisions of R.S. 11:62, 11:103, and 22:1476A(3), the fund is financed by a combination of employee contributions, employer contributions, and insurance premium taxes. The employee contribution rate is set by R.S. 11:62 but cannot be less than 8% or more than 10% of earnable compensation. The employee contribution rate is fixed at 8% for members whose earnable compensation is less than or equal to the poverty guidelines issued by the U. S. Department of Health and Human Services. Gross employer contributions are determined by actuarial valuation and are subject to change each year in accordance with R. S. 11:103 and 11:107.1. The employee contribution rate is set at 8% when gross employer contributions total 25% or less of earnable compensation. The employee rate then increases 0.25% for each 0.75% increase in the total rate, subject to a maximum rate of 10%. Insurance premium taxes are allocated to the system based on available funds and the statutory provisions as described in R.S. 22:1476A(3).

CONTRIBUTION REFUNDS - Upon withdrawal from service, members not entitled to a retirement allowance may receive a refund of accumulated contributions. Refunds are payable ninety days after the effective date of withdrawal from service.

RETIREMENT BENEFITS - Members with twelve years of creditable service may retire at age fifty-five; members with twenty years of service may retire at age fifty; members with twenty-five years of service may retire regardless of age, provided that they have been a member of this system for at least one year. The retirement allowance is equal to three and one-third percent of the member's average final compensation multiplied by his years of creditable service, not to exceed one hundred percent of his average final compensation.

OPTIONAL ALLOWANCES - Members may receive their benefits as a life annuity, or in lieu of such receive a reduced benefit according to the option selected which is the actuarial equivalent of the maximum benefit.

Option 1 - If the member dies before he has received in annuity payments the present value of his member's annuity as it was at the time of retirement the balance is paid to his beneficiary.

Option 2 - Upon retirement, the member receives a reduced benefit. Upon the member's death, the designated beneficiary will continue to receive the same reduced benefit.

Option 3 - Upon retirement, the member receives a reduced benefit. Upon the member's death, the designated beneficiary will receive one-half of the member's reduced benefit.

Option 4 - Upon retirement, the member elects to receive a board approved benefit payable to the member, the member's spouse, or the member's dependent child, which is actuarially equivalent to the maximum benefit.

A member may also elect to receive an actuarially reduced benefit which provides for an automatic 2 ½% annual compound increase in monthly retirement benefits based on the reduced benefit and commencing on the later of age fifty-five or retirement anniversary; this COLA is in addition to any ad hoc COLAs which are payable.

Initial Benefit Option – This option is available only to regular retirees who have not participated in the Deferred Retirement Option Plan. Under this option members may receive an initial benefit plus a reduced monthly retirement allowance which, when combined, equal the actuarially equivalent amount of the maximum retirement allowance. The initial benefit may not exceed an amount equal to thirty-six payments of the member's maximum retirement allowance. The initial benefit can be paid either as a lump-sum payment or placed in an account called an "initial benefit account" with interest credited thereto and monthly payments made from the account.

DISABILITY BENEFITS - Any member who has been officially certified as totally disabled solely as the result of injuries sustained in the performance of his official duties, or for any cause, provided the member has a least five years of creditable service and provided that the disability was incurred while the member was an active contributing member, is entitled to disability benefits. Any member under the age of fifty who becomes totally disabled will receive a disability benefit equal to 60% of final compensation for an injury received in the line of duty; or 75% of his accrued retirement benefit with a minimum of 25% of average salary for any injury received, even though not in the line of duty. Any member age fifty or older who becomes totally disabled from an injury sustained in the line of duty is entitled to a disability benefit equal to the greater of 60% of final compensation or his accrued retirement benefit. Any member age fifty or older who becomes totally disabled as a result of any injury, even though not in the line of duty, is entitled to a disability benefit equal to his accrued retirement benefit with a minimum of 25% of average salary. The surviving spouse of a member who was on disability retirement at the time of death receives a benefit of \$200 per month. When the member takes disability retirement, he may in addition take an actuarially reduced benefit in which case the member's surviving spouse receives 50% of the disability benefit being paid immediately prior to the death of the disability retiree. The retirement system may reduce benefits paid to a disability retiree who is also receiving workers compensation payments.

SURVIVOR BENEFITS - Benefits are payable to survivors of a deceased member who dies and is not eligible for retirement as follows. If any member is killed in the line of duty and leaves a surviving eligible spouse, the spouse is entitled to an annual benefit equal to two-thirds of the deceased member's final compensation. If any member dies from a cause not in the line of duty, the surviving spouse is entitled to an annual benefit equal to 3% of the deceased member's average final compensation multiplied by his total years of creditable service; however, in no event is the annual benefit less than 40% nor more than 60% of the deceased member's average final compensation. Children of the deceased member who are under the age of eighteen years are entitled to the greater of \$200 per month or 10% of average final compensation (not to exceed 100% of average final compensation) until reaching the age of eighteen or until the age of twenty-two if enrolled full-time in

an institution of higher learning, unless the surviving child is physically handicapped or mentally retarded in which case the benefit is payable regardless of age. If a deceased member dies leaving no surviving spouse, but at least one minor child, each child is entitled to receive forty percent of the deceased's average final compensation, not to exceed an aggregate of sixty percent of average final compensation.

DEFERRED RETIREMENT OPTION PLAN - In lieu of terminating employment and accepting a service retirement allowance, any member of the system who has at least twenty years of creditable service and who is eligible to receive a service retirement allowance may elect to participate in the deferred retirement option plan for up to thirty-six months and defer the receipt of benefits. Upon commencement of participation in the plan, membership in the system terminates and neither the employee nor employer contributions are payable. Compensation and creditable service will remain as they existed on the effective date of commencement of participation in the plan. The monthly retirement benefits that would have been payable, had the member elected to cease employment and receive a service retirement allowance, are paid into the deferred retirement option plan account. Upon termination of employment at the end of the specified period of participation, a participant in the program may receive, at his option, a lump sum payment from the account equal to the payments to the account, or a true annuity based upon his account, or he may elect any other method of payment if approved by the Board of Trustees. The monthly benefits that were being paid into the fund during the period of participation will begin to be paid to the retiree. If employment is not terminated at the end of the thirty-six months, payments into the account cease and the member resumes active contributing membership in the system. If the participant dies during the period of participation in the program, a lump sum payment equal to his account balance is paid to his named beneficiary or, if none, to his estate; in addition, normal survivor benefits are payable to survivors of retirees.

COST OF LIVING INCREASES - The Board of Trustees is authorized to grant retired members and widows of members who have retired an annual cost of living increase of up to 3% of their current benefit, and all retired members and widows who are sixty-five years of age and older a 2% increase in their original benefit. In order for the Board to grant either of these increases the system must meet certain criteria detailed in the statute related to funding status and interest earnings. In lieu of these cost of living adjustments the Board may also grant an increase in the form of " $X \times (A+B)$ " where "X" is any amount up to \$1 per month, and "A" is equal to the number of years of credited service accrued at retirement or at death of the member or retiree, and "B" is equal to the number of years since retirement or since death of the member or retiree to June thirtieth of the initial year of such increase.

ACTUARIAL ASSUMPTIONS

In determining actuarial costs, certain assumptions must be made regarding future experience under the plan. These assumptions include the rate of investment return, mortality of plan members, rates of salary increase, rates of retirement, rates of termination, rates of disability, and various other factors that have an impact on the cost of the plan. To the extent that future experience varies from the assumptions selected for valuation, future costs will be either higher or lower than anticipated. The following chart illustrates the effect of emerging experience on the plan.

Factor	Increase in Factor Results in
Investment Earnings Rate	Decrease in Cost
Annual Rate of Salary Increase	Increase in Cost
Rates of Retirement	Increase in Cost
Rates of Termination	Decrease in Cost
Rates of Disability	Increase in Cost
Rates of Mortality	Decrease in Cost

ACTUARIAL COST METHOD: Individual Entry Age Normal With Allocation of Cost Based on Earnings. Entry and Attained Ages Calculated on an Age Near Birthday Basis.

VALUATION INTEREST RATE: 7.40% (Net of investment expense)

ACTUARIAL ASSET VALUES: All assets are valued at market value adjusted to defer four-fifths of all earnings above or below the valuation interest rate in the valuation year, three-fifths of all earnings above or below the valuation interest rate in the prior year, two-fifths of all earnings above or below the valuation interest rate from two years prior, and one-fifth of all earnings above or below the valuation interest rate from three years prior. The resulting smoothed values are subject to a corridor of 85% to 115% of the market value of assets. If the smoothed value falls outside the corridor, the actuarial value is set equal to the average of the corridor limit and the smoothed value.

ACTIVE, ANNUITANT AND BENEFICIARY MORTALITY: RP-2000 Combined Healthy with Blue Collar Adjustment Sex Distinct Mortality Tables Projected to 2031 using Scale AA

RETIREE COST OF LIVING INCREASES: The present value of future retirement benefits is based on benefits currently being paid by the system and includes previously granted cost of living increases. The present values do not

include provisions for potential future increases not yet authorized by the Board of Trustees.

ANNUAL SALARY INCREASE RATE:

Salary increases include 2.775% inflation and merit increases. The gross rates including inflation and merit increases are as follows:

Years of Service	Salary Growth Rate
1 – 2	15.000%
3 – 14	5.750%
15 – 24	5.250%
25 & over	4.750%

RETIREMENT RATES:

The table of these rates is included later in the report. These rates apply only to those individuals eligible to retire.

RETIREMENT LIMITATIONS:

Projected retirement benefits are not subject to IRS Section 415 limits.

DROP ENTRY RATES:

The table of these rates is included later in the report. These rates apply only to those individuals eligible to participate.

DROP PARTICIPATION PERIOD:

All DROP participants are assumed to participate for 3 years and retire at the end of this participation period.

RETIREMENT RATES FOR ACTIVE FORMER DROP PARTICIPANTS:

Retirement rates for active former DROP participants are as follows:

Ages	Retirement Rates
74 & Under	0.25
75 & Over	1.00

DISABILITY RATES:

55% of the disability rates used for the 21st valuation of the Railroad Retirement System for individuals with 10-19 years of service. The table of these rates is included later in the report. 20% of total disabilities are assumed to be in the line of duty.

WITHDRAWAL RATES:

The rates of withdrawal are applied based upon completed years of service according to the following table:

<u>Service</u>	<u>Factor</u>	<u>Service</u>	<u>Factor</u>
<1	0.075	6	0.050
1	0.065	7	0.040
2	0.065	8	0.030
3	0.065	9	0.020
4	0.050	>9	0.010
5	0.050		

Note: The withdrawal rate for individuals eligible to retire is assumed to be zero.

MARRIAGE STATISTICS: 70% of the members are assumed to be married; husbands are assumed to be three years older than wives.

SERVICE RELATED DEATH: 20% of Total Deaths

FAMILY STATISTICS: Assumptions utilized in determining the costs of various survivor benefits as listed below, are derived from the information provided in the 2010 U. S. Census:

<u>Member's Age</u>	<u>% With Children</u>	<u>Number of Children</u>	<u>Average Age</u>
25	70%	1.84	5
35	86%	2.13	9
45	75%	1.70	12
55	22%	1.42	14
65	4%	1.45	15

DISABLED LIVES MORTALITY: RP-2000 Disabled Lives Mortality Tables set back 5 years for males and set back 3 years for females

VESTING ELECTING PERCENTAGE: 70% of those vested elect deferred benefits in lieu of contribution refunds.

ACTUARIAL TABLES AND RATES

Age	Male Mortality Rates	Female Mortality Rates	Retirement Rates	DROP Entry Rates	Disability Rates
18	0.00017	0.00012	0.000000	0.000000	0.000830
19	0.00018	0.00012	0.000000	0.000000	0.000830
20	0.00019	0.00012	0.000000	0.000000	0.000830
21	0.00020	0.00011	0.000000	0.000000	0.000830
22	0.00022	0.00011	0.000000	0.000000	0.000830
23	0.00023	0.00012	0.000000	0.000000	0.000830
24	0.00025	0.00013	0.000000	0.000000	0.000830
25	0.00028	0.00013	0.000000	0.000000	0.000830
26	0.00031	0.00015	0.000000	0.000000	0.000830
27	0.00033	0.00015	0.000000	0.000000	0.000830
28	0.00034	0.00016	0.000000	0.000000	0.000830
29	0.00035	0.00017	0.000000	0.000000	0.000830
30	0.00062	0.00021	0.000000	0.000000	0.000830
31	0.00068	0.00026	0.000000	0.000000	0.000830
32	0.00075	0.00029	0.000000	0.000000	0.000830
33	0.00081	0.00031	0.000000	0.000000	0.000830
34	0.00087	0.00034	0.000000	0.000000	0.000830
35	0.00093	0.00037	0.000000	0.000000	0.000940
36	0.00098	0.00040	0.000000	0.000000	0.001050
37	0.00103	0.00043	0.000000	0.000000	0.001160
38	0.00105	0.00046	0.000000	0.000000	0.001320
39	0.00106	0.00050	0.000000	0.000000	0.001490
40	0.00107	0.00055	0.000000	0.000000	0.001710
41	0.00108	0.00061	0.060000	0.150000	0.001930
42	0.00110	0.00067	0.060000	0.150000	0.002150
43	0.00113	0.00074	0.060000	0.150000	0.002420
44	0.00116	0.00080	0.060000	0.150000	0.002750
45	0.00120	0.00084	0.060000	0.150000	0.003140
46	0.00122	0.00088	0.060000	0.150000	0.003580
47	0.00126	0.00091	0.060000	0.150000	0.004020
48	0.00129	0.00097	0.060000	0.150000	0.004570
49	0.00133	0.00104	0.060000	0.150000	0.005170
50	0.00137	0.00115	0.060000	0.170000	0.005890
51	0.00151	0.00127	0.060000	0.170000	0.006710
52	0.00160	0.00145	0.060000	0.170000	0.007590
53	0.00176	0.00166	0.060000	0.170000	0.008640
54	0.00195	0.00190	0.060000	0.170000	0.009790
55	0.00232	0.00218	0.060000	0.170000	0.011110
56	0.00283	0.00254	0.060000	0.170000	0.012650
57	0.00331	0.00290	0.060000	0.170000	0.014360
58	0.00388	0.00325	0.060000	0.170000	0.016280
59	0.00440	0.00369	0.060000	0.170000	0.018540
60	0.00502	0.00424	0.060000	0.170000	0.026840
61	0.00590	0.00496	0.060000	0.170000	0.026840
62	0.00674	0.00581	0.060000	0.170000	0.026840
63	0.00795	0.00683	0.060000	0.170000	0.026840
64	0.00892	0.00782	0.060000	0.170000	0.026840
65	0.01004	0.00890	0.500000	0.170000	0.026840
66	0.01170	0.01013	0.500000	0.170000	0.026840
67	0.01303	0.01131	0.500000	0.170000	0.026840
68	0.01400	0.01260	0.500000	0.170000	0.026840
69	0.01547	0.01403	0.500000	0.170000	0.026840
70	0.01675	0.01595	0.500000	0.000000	0.026840
71	0.01836	0.01721	0.500000	0.000000	0.026840
72	0.02015	0.01914	0.500000	0.000000	0.026840
73	0.02216	0.02056	0.500000	0.000000	0.026840
74	0.02444	0.02267	0.500000	0.000000	0.026840
75	0.02786	0.02408	0.500000	0.000000	0.026840

PRIOR YEAR ASSUMPTIONS

VALUATION INTEREST RATE: 7.5% (Net of investment expense)

INFLATION RATE: 2.875%

GLOSSARY

Accrued Benefit – The pension benefit that an individual has earned as of a specific date based on the provisions of the plan and the individual's age, service, and salary as of that date.

Actuarial Accrued Liability – The actuarial present value of benefits payable to members of the fund less the present value of future normal costs attributable to the members.

Actuarial Assumptions - Assumptions as to the occurrence of future events affecting pension costs. These assumptions include rates of mortality, withdrawal, disablement, and retirement. Also included are rates of investment earnings, changes in compensation, as well as statistics related to marriage and family composition.

Actuarial Cost Method – A procedure for determining the portion of the cost of a pension plan to be allocated to each year. Each cost method allocates a certain portion of the actuarial present value of benefits between the actuarial accrued liability and future normal costs. Once this allocation is made, a determination of the normal cost attributable to a specific year can be made along with the payment to amortize any unfunded actuarial accrued liability. To the extent that a particular funding method allocates a greater (lesser) portion of the actual present value of benefits to the actuarial accrued liability it will allocate less (more) to future normal costs.

Actuarial Equivalence – Payments or receipts with equal actuarial value on a given date when valued using the same set of actuarial assumptions.

Actuarial Gain (Loss) – The financial effect on the fund of the difference between the expected and actual experience of the fund. The experience may be related to investment earnings above (or below) those expected or changes in the liability structure due to fewer (or greater) than the expected numbers of retirements, deaths, disabilities, or withdrawals. In addition, other factors such as pay increases above (or below) those forecast can result in actuarial gains or losses. The effect of such gains (or losses) is to decrease (or increase) future costs.

Actuarial Present Value - The value, as of a specified date, of an amount or series of amounts payable or receivable thereafter, with each amount adjusted to reflect the time value of money (through accrual of interest) and the probability of payments. For example: if \$600 invested today will be worth \$1,000 in 10 years and there is a 50% probability that a person will live 10 years, then the actuarial present value of \$1,000 payable to that person if he should survive 10 years is \$300.

Actuarial Value of Assets - The value of cash, investments, and other property belonging to the pension plan as used by the actuary for the purpose of the actuarial valuation. This may correspond to the book value, market value, or some modification involving either or both book and market value. Adjustments to market values are often made to reduce the volatility of asset values.

Asset Gain (Loss) - That portion of the actuarial gain attributable to investment performance above (below) the expected rate of return in the actuarial assumptions.

Amortization Payment - That portion of the pension plan contribution designated to pay interest and reduce the outstanding principal balance of unfunded actuarial accrued liability. If the amortization payment is less than the accrued interest on the unfunded actuarial accrued liability the outstanding principal balance will increase.

Contribution Shortfall (Excess) - The difference between contributions recommended in the prior valuation and the actual amount received.

Decrements – Events which result in the termination of membership in the system such as retirement, disability, withdrawal, or death.

Employer Normal Cost - That portion of the normal cost not attributable to employee contributions. It includes both direct contributions made by the employer and contributions from other non-employee sources such as revenue sharing and revenues related to taxes.

Funded Ratio – A measure of the ratio of assets to liabilities of the system according to a specific definition of those two values. Typically the assets used in the measure are the actuarial value of assets; the liabilities are defined by reference to some recognized actuarial funding method. Thus the funded ratio of a plan depends not only on the financial strength of the plan but also on the funding method used to determine the liabilities and the asset valuation method used to determine the assets in the ratio.

Normal Cost - That portion of the actuarial present value of pension plan benefits and expenses allocated to a valuation year by the actuarial cost method. This is analogous to one year's insurance premium.

Pension Benefit Obligation - The actuarial present value of benefits earned or credited to date based on the members expected final average compensation at retirement. For current retirees or terminated members this is equivalent to the actuarial present value of their accrued benefit.

Projected Benefits – The benefits expected to be paid in the future based on the provisions of the plan and the actuarial assumptions. The projected values are based on anticipated future advancement in age and accrual of service as well as increases in salary paid to the participant.

Unfunded Actuarial Accrued Liability - The excess of the actuarial accrued liability over the actuarial value of assets.

Vested Benefits - Benefits that the members are entitled to even if they withdraw from service.