

**FIREFIGHTERS'
RETIREMENT SYSTEM**

ACTUARIAL VALUATION AS OF
JUNE 30, 2021

(Revised)

G. S. CURRAN & COMPANY, LTD.

Actuarial Services

10555 N. Glenstone Place • Baton Rouge, Louisiana 70810 • (225)769-4825

Gary S. Curran, FCA, MAAA, ASA, EA
Consulting Actuary

Gregory M. Curran, FCA, MAAA, ASA, EA
Consulting Actuary

December 22, 2021

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, 2021. 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, 2022 and to recommend the net direct employer contribution rate for Fiscal 2023. 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.

This report contains non-material revisions to the statement of fiduciary net position and the statements of changes in fiduciary net position which were made after completion of the annual valuation. The total value of assets was unaffected by the changes, but slight recategorization occurred within Exhibit III-A and Exhibit VI to reflect the changes in the system's final financial statements.

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 actuary is a member of the American Academy of Actuaries, has met the qualification standards for the American Academy of Actuaries to render the actuarial opinions incorporated in this report, and is available to provide further information or answer any questions with respect to this valuation.

Sincerely,

G. S. CURRAN & COMPANY, LTD.

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

TABLE OF CONTENTS

<u>SUBJECT</u>	<u>PAGE</u>
SUMMARY OF VALUATION RESULTS	1
GENERAL COMMENTS.....	2
COMMENTS ON DATA	3
COMMENTS ON ACTUARIAL METHODS AND ASSUMPTIONS.....	4
RISK FACTORS.....	6
CHANGES IN PLAN PROVISIONS.....	9
ASSET EXPERIENCE	9
DEMOGRAPHICS AND LIABILITY EXPERIENCE	10
FUNDING ANALYSIS AND RECOMMENDATIONS.....	11
COST OF LIVING INCREASES	12
GRAPHS	14
EXHIBIT I – ANALYSIS OF ACTUARIALLY REQUIRED CONTRIBUTIONS.....	20
EXHIBIT II – PRESENT VALUE OF FUTURE BENEFITS	21
EXHIBIT III – SCHEDULE A: MARKET VALUE OF ASSETS	22
EXHIBIT III – SCHEDULE B: ACTUARIAL VALUE OF ASSETS	23
EXHIBIT IV – PRESENT VALUE OF FUTURE CONTRIBUTIONS	24
EXHIBIT V - SCHEDULE A: ACTUARIAL ACCRUED LIABILITIES.....	24
EXHIBIT V - SCHEDULE B: CHANGE IN UNFUNDED ACTUARIAL ACCRUED LIABILITY	24
EXHIBIT V - SCHEDULE C: AMORTIZATION OF UAL	25
EXHIBIT VI – ANALYSIS OF CHANGE IN ASSETS	26
EXHIBIT VII – PENSION BENEFIT OBLIGATION	27
EXHIBIT VIII – CENSUS DATA.....	28
EXHIBIT IX – YEAR-TO-YEAR COMPARISON.....	36
SUMMARY OF PRINCIPAL PLAN PROVISIONS	38
ACTUARIAL ASSUMPTIONS	41
PRIOR YEAR ASSUMPTIONS	45
GLOSSARY.....	46

SUMMARY OF VALUATION RESULTS FIREFIGHTERS' RETIREMENT SYSTEM

Valuation Date:	June 30, 2021	June 30, 2020
Census Summary:		
Active Members	4,450	4,426
Retired Members and Survivors	2,578	2,497
DROP Participants	241	220
Terminated Due a Deferred Benefit	99	85
Terminated Due a Refund	811	763
Payroll (excluding DROP participants):	\$ 249,159,310	\$ 245,786,834
Benefits in Payment (excluding DROP accruals):	\$ 108,262,093	\$ 102,305,923
Present Value of Future Benefits	\$ 3,403,877,879	\$ 3,214,041,115
Actuarial Accrued Liability (EAN):	\$ 2,681,184,069	\$ 2,530,844,605
Frozen Unfunded Actuarial Accrued Liability:	\$ 523,878,929	\$ 554,826,689
Actuarial Value of Assets (AVA):	\$ 2,111,737,202	\$ 1,914,024,117
Market Value of Assets (MVA):	\$ 2,326,798,869	\$ 1,837,689,661
Ratio of AVA to Actuarial Accrued Liability:	78.76%	75.63%
	Fiscal 2021	Fiscal 2020
Market Rate of Return:	26.1%	3.1%
Actuarial Rate of Return:	9.9%	4.9%
	Fiscal 2022	Fiscal 2021
Employers' Normal Cost (Mid-year):	\$ 45,438,572	\$ 44,796,726
Amortization Cost (Mid-year):	\$ 66,532,163	\$ 67,464,313
Estimated Administrative Cost:	\$ 2,030,080	\$ 1,889,681
Projected Insurance Premium Taxes Due:	<u>\$ (28,472,051)</u>	<u>\$ (28,567,788)</u>
Net Direct Employer Actuarially Required Contributions:	\$ 85,528,764	\$ 85,582,932
Projected Payroll:	\$ 257,398,495	\$ 254,011,517
Statutory Employee Contribution Rate: *	10.00%	10.00%
Board Approved Net Direct Employer Contribution Rate: *	33.75%	32.25%
Actuarially Required Net Direct Employer Contribution Rate: *	33.23%	33.69%
	Fiscal 2023	Fiscal 2022
Minimum Recommended Net Direct Employer Cont. Rate: *	33.25%	33.75%

* 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. Currently, the system's computer database does not contain DROP member salaries. Since this information is required to value the payment of benefits based on current actuarial assumptions related to potential post-DROP service, estimates of these salaries were made based on each DROP participant's historical average salaries. 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 4,450 active contributing members in the system of whom 2,192 have vested retirement benefits; in addition, there are 241 participants in the Deferred Retirement Option Plan (DROP); 2,578 former members or their beneficiaries are receiving retirement benefits. An additional 910 terminated members have contributions remaining on deposit with the system; of this number 99 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 Louisiana Legislative Auditor's office. As indicated in the system's financial statements, the net market value of the system's assets was \$2,326,798,869 as of June 30, 2021. Net investment income for Fiscal 2021 measured on a market value basis was \$480,438,532. Contributions to the system for the fiscal year totaled \$136,574,599; benefits and expenses amounted to \$127,903,923.

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

Prior to the 2019 actuarial valuation, all valuations of the Firefighters' Retirement System were based on the Entry Age Normal actuarial cost method. As of June 30, 1989, under the provisions of Louisiana R.S. 11:103, the funding excess for the plan which was determined to be \$239,425 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 were 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 were amortized over thirty years. Act 620 of the 2003 Regular Session of the Louisiana Legislature changed the amortization of unfunded accrued liability. 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. Act 422 of the 2009 Regular Session of the Louisiana Legislature further changed the amortization of unfunded accrued liability. 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 were then amortized over 15 years. All amortization payments were set on a level dollar basis. Act 91 of the 2019 Regular Session of the Louisiana Legislature changed the funding method for use in actuarial valuations of the Firefighters' Retirement System from the Entry Age Normal actuarial cost method to the Frozen Initial Liability actuarial cost method. This change was effective with the 2019 valuation. Based upon this change, all non-merger outstanding balances on the system's entry age normal unfunded actuarial accrued liability as of June 30, 2019, were frozen, combined, and re-amortized over a fifteen-year period with payments set to decrease by one percent each year. The remaining merger bases were not changed and will be paid off according to their original schedule. With this change, all actuarial experience gains and losses, contribution gains and losses, gains and losses arising from changes in benefits, and gains and losses arising from changes in assumptions which occur in fiscal years after 2019 are included in the calculation of the plan's normal cost according to the Frozen Initial Liability funding method.

Since the Frozen Initial Liability funding method spreads actuarial gains and losses over future normal costs, favorable plan experience will lower future normal costs while unfavorable plan experience will increase future normal costs. Overall costs may increase or decrease depending on payroll growth. Since payments on the frozen unfunded accrued liability are set to decrease by one percent per year over the next thirteen years, future amortization payments as a percentage of payroll will remain level should payroll decrease by one percent per year. Any reduction in payroll less than one percent or any increase in payroll will decrease the amortization costs as a percentage of payroll. Payroll reductions of greater than one percent will increase the amortization costs 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, NEPC. 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 subsequent five actuarial valuations with reductions of 0.10% each year, beginning with the June 30, 2017 valuation. A review of the valuation interest rate for Fiscal 2019 based on updated capital market assumptions found that the 7.20% valuation interest rate scheduled for use in the 2019 actuarial valuation was no longer inside the reasonable range determined by the actuary. Therefore,

the assumed rate of return for the Fiscal 2019 valuation was set at 7.15%. For Fiscal 2020, an updated review of the system's valuation interest rate was performed using the latest target asset allocation. This review was based on capital market assumptions in the 2020 G. S. Curran & Company Consultant Average. Based upon this review, the Board elected to further reduce the valuation interest rate for use in the Fiscal 2020 valuation to 7.00% which was found to be within the reasonable range. Prior to the completion of the Fiscal 2021 valuation, the system's actuary notified the Board of Trustees that the 7% valuation interest rate used in the Fiscal 2020 valuation remained within the actuary's reasonable range. However, given the sizable market rate of return for Fiscal 2021 and the Board's stated desire to reduce the risk inherent in the assumed rate of return, the actuary recommended that the Board consider opportunistically lowering the valuation interest rate. The Board of Trustees authorized the actuary to lower the return assumption to a level that would not cause an increase in the minimum recommended employer contribution rate for Fiscal 2023 when compared to Fiscal 2022. Based upon this decision, the valuation interest rate was lowered to 6.9%.

The actuary's reasonable range was determined through the development of 10,000 trials spanning 30 years. These trials were performed by assuming that the expected returns on the portfolio as a whole are normally distributed and using the determined consultant average nominal rate of return and long-term portfolio standard deviation. These stochastic trials were then used to determine return levels for each percentile. The reasonable range boundaries were set based on the 40th and 60th percentile expected return levels. Based upon these assumptions and the stochastic simulations, we estimate that there is a 48% probability that the fund will have earnings at or above 6.90% in the long term and a 50% probability that the fund will have earnings at or above 6.78% in the long term.

The remaining actuarial assumptions utilized for this report are based on the results of an actuarial experience study for the period July 1, 2014 – June 30, 2019, unless otherwise specified in this report. This study included a review of all plan decrements in addition to salary scale experience and other demographic factors which impact plan costs. The Experience Study report contains details related to each assumption including the actuary's recommended changes. The Board of Trustees adopted the Experience Study report and authorized the actuary to utilize the new set of assumptions contained therein within the Fiscal 2020 actuarial valuation.

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 at the end of this report. All assumptions used are based on estimates of future long-term experience for the fund as described in the system's 2020 Experience Study report. 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 on the normal cost accrual rate was an increase of 1.6638% of the Fiscal 2022 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. Louisiana constitutional and statutory provisions greatly limit this risk by requiring that state and statewide plans maintain funding on an actuarial basis. The State Constitution sets forth general requirements with specific funding parameters specified in the state statutes.

All pension plans are subject to the uncertainty of asset performance. The total nominal rate of return on assets is comprised of the real rates of return earned on the portfolio of investments plus the underlying inflation rate. High levels of inflation are a risk to plan members in that they reduce purchasing power of plan benefits. As the plan attempts to offset inflation by providing permanent benefit increases, costs will inevitably increase unless provisions are made to prefund such adjustments. Very low inflation will generally reduce the nominal rate of return on assets; deflation can potentially reduce the capital value of trust assets. During the decade preceding 2020, inflation levels remained in a fairly narrow range, yet inflation has significantly increased since the beginning of the Covid-19 pandemic. Forecasts from investment professionals prior to the pandemic generally called for a continuation of a low inflation environment. Although many forecasters believe that recent inflation spikes will be transitory, at this time there is significant uncertainty related to future inflation. There is always the possibility that high inflation will become a problem in the future or that the country will experience a deflationary period; however, most expert opinion currently assesses these alternatives as unlikely in the near term.

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. Volatility of returns will be determined by both market conditions and the asset allocation of the investment portfolio. If the system's investment portfolio has a substantial allocation to assets that have low price stability, the risk of portfolio volatility will increase, although low correlations among asset classes can mitigate this risk. Another element of asset risk is reinvestment risk. Interest rate declines can subject pension plans to an increase in this risk. As fixed income securities mature, investment managers may be forced to reinvest funds at decreasing rates of return. For the foreseeable future it is unlikely, though not impossible, that interest rates will decline mitigating the reinvestment risk the plan currently faces.

The system is also exposed to risk related to cash flow. Where benefit payments exceed contributions to a plan, the plan will be required to use investment income or potentially investment capital to pay benefits. In cases where it is necessary to use investment income to pay retirement benefits, investment market downturns will place additional stress on the portfolio and make the recovery from such downturns more difficult since funds available for reinvestment are reduced by benefit payments. The historical cash flow graph and demonstration given in this report illustrates the noninvestment cash flow and benefit payments of the system over the last 10 years. Currently, annual contributions slightly exceed annual benefit payments to the plan. Future net noninvestment cash flows for the system will be determined based upon both the system maturity and future contribution levels. Hence, increases in future contributions due to adverse actuarial experience will tend to mitigate the potential of negative cash flows arising from the natural maturation of the system whereas reduced contribution levels

resulting from positive experience will tend to increase the extent of negative cash flows. Absent a significant increase in the active membership of the system, the trend of higher proportions of retired membership will continue and the system could experience negative noninvestment cash flows.

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. In a general sense, the short-term effects of these risks on the cost structure of the plan are somewhat limited since changes in these factors tend to be gradual and follow long-term secular trends. Final average compensation plans are also vulnerable to unexpectedly large increases in salary for individual members near retirement. The effect of such events frequently relates to pay plan revisions where salaries “catch-up” after a number of years of slow growth. Revisions of this type usually depend on general economic conditions and can result in liability losses. However, they generally are infrequent and are more of a short-term issue.

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 (such as pandemics like COVID-19) can present risks to the plan. These events can affect member payroll and plan demographics, both of which impact costs. The risk associated with either of these factors can vary depending upon the severity of the event and cannot be easily forecast.

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. The ratio is 78.76% for the plan as of June 30, 2021. 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. Exhibit IX gives a history of this value for the last ten years. Note that the underlying trend is somewhat disguised since the system has significantly reduced the valuation interest rate over this period. Absent the reduction in this rate, the current ratio would be significantly higher. One additional risk measure is the sensitivity of the plan’s cost structure to asset gains and losses. 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 (decrease) in the actuarially required contribution as a percentage of projected payroll of 0.76% for the fund.

Each pension plan has its own unique benefit structure and demographic profile. As a result, each plan will respond to changes in interest rates in a unique way. As the expected rate of return on investments changes and the interest rate used to discount plan liabilities is adjusted, the shift in plan liabilities will

depend upon the duration of the liabilities (which can be understood as the plan's sensitivity to the change in the interest rate). A slightly different measure of the duration for the plan can also be understood as an indicator of the plan's maturity. When a pension plan is first established, all of the participants are active members; as members retire and the plan matures, the duration of the plan decreases. A determination of the liability duration gives some insight into the investment time horizon of the plan. Thus, the liability duration of a closed plan can be thought of as the weighted "center of gravity" of plan benefit cash flows with expected cash flows occurring both before and after the duration value. For open plans with a continuous flow of new entrants this measure is somewhat less informative since the duration horizon keeps changing as new members enter the plan. For this plan we have estimated the effective liability duration as 11.13.

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 vulnerable 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 2021, this ratio is 43%; ten years ago, this ratio was 30%.

One other area of exposure the plan faces is the possibility that plan assumptions will need to be revised to conform to changing actual or expected plan experience. Such assumption revisions may relate to economic or demographic factors. With regard to the economic assumptions, there is always the possibility that market expectations will require an adjustment to the assumed rate of return. Current market expectations related to the assumed rate of return suggest that a decrease in the assumption is more probable than an increase. The magnitude of any potential such change will be related to future capital market expectations. 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 2022 by 16.52% of payroll. Future adjustments to the future assumed rates of return may be required; however, the likelihood of such an event is difficult to gauge since it requires assigning probabilities to future capital market scenarios.

Noneconomic assumptions such as mortality or other rates of decrement such as withdrawal, retirement, or disability are also subject to change. In general, such changes tend to affect plan costs less than adjustments to the assumed rates of return. Quantifying the probability or magnitude of such changes is beyond the scope of this report.

In summary, 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 assumptions, and changes in plan provisions or applicable law. 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, factors such as those outlined above have the potential on their own accord to pose a significant risk to future cost levels and solvency of the system.

CHANGES IN PLAN PROVISIONS

The following changes to the system were enacted during the 2021 Regular Session of the Louisiana Legislature:

Act 140 expands the definition of “beneficiary” in the statutes related the Firefighters’ Retirement System (FRS) to include any natural or juridical person or estate administrator designated to receive a pension, an annuity, a retirement allowance or other benefit. Act 140 also adds language related to Option 4 benefits provided to a child or children with permanent mental or physical disability to require proof of such disability through medical determination along with who is responsible for the cost of the medical review. Additionally, Act 140 allows for payments of benefits to an estate administrator on behalf of a spouse or child if the spouse or child is a legatee. The estate administrator is required to notify the system if any legatee deceases.

Act 250 provides relative to charging employers a portion of the system’s entry age normal unfunded actuarial accrued liability if they fully or partially dissolve their fire department. If an employer fully dissolves its fire department, they will be required to pay the portion of unfunded accrued liability existing from the prior valuation adjusted with interest at the system’s valuation interest rate. The portion of unfunded accrued liability is to be calculated by using the allocation percentage from the prior fiscal year’s employer pension report produced according to requirements established by GASB. If an employer partially dissolves its fire department, the employer will be required to pay a pro rata portion of that amount. In addition, the act provides for the recovery of reasonable attorney fees and court costs in cases of delinquent payments recovered by action in a court of competent jurisdiction or in any concursus proceeding wherein the Firefighters’ Retirement System is named as a party. The act further states that if an employer fails to make a payment timely, the amount may be collected by action of a court of competent jurisdiction against the employer or by certifying to the state treasurer all amounts due and asking the state treasurer to deduct such monies payable to the certified delinquent party and to remit such amounts directly to the Firefighters’ Retirement System. The act also provides that if a member with at least 12 years of service who executed a valid assignment of employee contributions dies with no person due survivors’ benefits under R.S. 11:2256, his contributions shall be delivered to the credit union.

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>
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%
2018	6.5%	5.6%
2019	4.4%	4.5%
2020	3.1%	4.9%
2021	26.1%	9.9%

† 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 2017 – 2021)	10.4%
10-year average (Fiscal 2012 – 2021)	6.6%
15-year average (Fiscal 2007 – 2021)	5.4%
20-year average (Fiscal 2002 – 2021)	5.8%
25-year average (Fiscal 1997 – 2021)	5.9%
30-year average (Fiscal 1992 – 2021)	6.5%

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 2021 the fund earned \$21,756,385 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 \$467,124,565. This income was offset by investment expenses of \$8,442,418.

The actuarial rate of return is presented for comparison to the assumed long-term rate of return of 7.00% used for the prior valuation (6.90% beginning with July 1, 2021). 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 2021, the system experienced net actuarial investment earnings of \$54,762,380 above the actuarial assumed earnings rate in effect for Fiscal 2021 of 7.00%. This excess in earnings produced an actuarial gain, which decreased the normal cost accrual rate by 1.9689%.

DEMOGRAPHICS AND LIABILITY EXPERIENCE

A reconciliation of the census for the system is given in Exhibit VIII. The average active contributing member is 38 years old with 11.71 years of service credit and an annual salary of \$55,991. The system's active contributing membership experienced an increase of 24 members during Fiscal 2021. The number of DROP participants increased by 21 during Fiscal 2021. Over the last five years active membership has increased by 88 members. A review of the active census by age indicates that over the last ten years the population has remained relatively stable. Over the same ten-year period the system's active census by service shows fewer members with less than five years of service while most other service categories show slight increases.

The average service retiree is 66 years old with an annual benefit of \$47,409. The average age of members at retirement is 53. The number of retirees and beneficiaries receiving benefits from the system increased by 81 during the fiscal year. Over the last five years, the number has increased by 365; during the same period, the annual benefits in payment increased by \$24,363,058.

Plan liability experience for Fiscal 2020 was slightly unfavorable. Retirements of active former DROP participants were below projected levels. Salary increases were below projected levels at most

durations. Withdrawals and retiree deaths exceeded projected levels. These items tend to reduce costs. Offsetting the reduction were active retirements, DROP entries, and disabilities above projected levels. In aggregate, plan liability losses increased the normal cost accrual rate by 0.2152%.

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 portion of annual cost based on the salary of active participants. 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. Under the funding method used for the plan since 2019, changes in plan experience, benefits, or assumptions do not affect the frozen unfunded actuarial accrued liability. These items increase or decrease future normal costs. Payroll growth affects plan costs since payments on the system’s frozen unfunded liability are set to decrease by 1% per year or are set based upon a level schedule. Therefore, 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.

Liability and asset experience as well as changes in assumptions and benefits can increase or decrease plan costs. In addition to these factors, any COLA granted in the prior fiscal year will increase required future contributions. New entrants to the system can also increase or decrease costs as a percent of payroll depending upon their demographic distribution and other factors related to prior plan experience. Finally, contributions above or below requirements may reduce or increase future costs.

The effects of various factors on the fund’s cost structure are outlined below:

Employer’s Normal Cost Accrual Rate – Fiscal 2020	17.6377%
Factors Increasing the Normal Cost Accrual Rate:	
Liability Assumption Loss	1.6638%
Liability Experience Loss	0.2152%
Contribution Loss	0.1613%

Factors Decreasing the Normal Cost Accrual Rate:

Asset Experience Gain	1.9689%
New Members	0.0877%
Employer's Normal Cost Accrual Rate – Fiscal 2021	17.6214%

In addition to the above factors, payroll growth affects plan costs to the extent that payments on the system's frozen unfunded liability are on a schedule that varies from actual trends in payroll growth or decline. If payroll changes at rates not consistent with the amortization schedule, the result will be costs that change as a percentage of payroll. For Fiscal 2021, the net effect of the change in projected payroll and a lower UAL payment on amortization costs was to decrease such costs by 0.71% of payroll.

The derivation of the actuarially required contribution for the current fiscal year is given in Exhibit I. The employer normal cost for Fiscal 2022, interest adjusted for mid-year payment is \$45,438,572. The interest adjusted amortization payments on the system's unfunded actuarial accrued liability totaled \$66,532,163. The total actuarially required contribution is determined by summing these two values together with estimated administrative expenses. As given in line 16 of Exhibit I the total actuarially required contribution for Fiscal 2022 is \$114,000,815. We estimate insurance premium taxes of \$28,472,051, or 11.06% of payroll, will be paid to the system in Fiscal 2022. This level of Insurance Premium Taxes represents a 0.19% decrease from the prior year as a percentage of payroll. Hence, the total actuarially required net direct employer contribution for Fiscal 2022 amounts to \$85,528,764 or 33.23% of payroll. Since the actual employer contribution rate for Fiscal 2022 is 33.75% of payroll, there will be a contribution surplus of 0.52% of payroll. This surplus will decrease the actuarially required contribution recommended for Fiscal 2023. In order to determine a minimum recommended net direct employer contribution rate for Fiscal 2023, the Employers' Minimum Net Direct Actuarially Required Contribution for Fiscal 2022 was adjusted for the impact of the estimated contribution surplus. R.S. 11:103 requires that the net direct employer contributions be rounded to the nearest 0.25%. The resulting Minimum Recommended Net Direct Employer Contribution Rate for Fiscal 2023 is 33.25%.

COST OF LIVING INCREASES

During Fiscal 2021, the actual cost of living (as measured by the US Department of Labor CPI-U) increased by 5.4%. 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 for cost-of-living benefits payable based on a formula equal to up to \$1 times the total of the number of years of credited service accrued at retirement or at death of the member or retiree plus the number of years since retirement or since death of the member or retiree to the system's fiscal year end preceding the payment of the benefit increase. The provisions of R.S. 11:241 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).

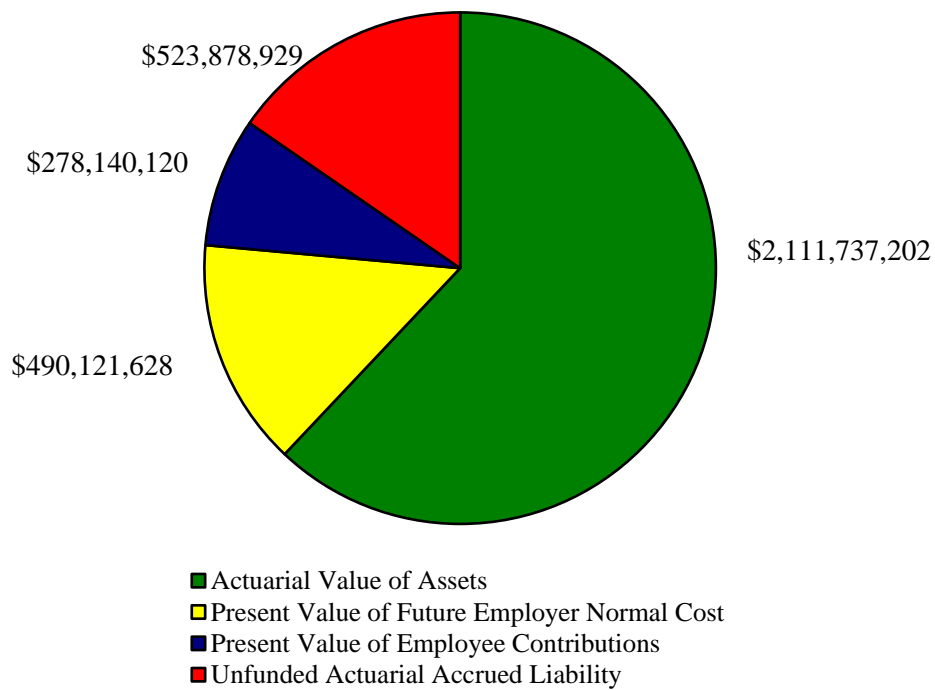
With a funded ratio (as measured by the Actuarial Value of Assets divided by the Pension Benefit Obligation) of 80.56% and since the system last granted a cost of living increase on January 1, 2015 which is not within the three most recent fiscal years, we have determined that for Fiscal 2021 the plan meets the criteria set forth in R. S. 11:243 for granting a cost-of-living increase.

Below is a summary of available cost of living increases and their respective costs:

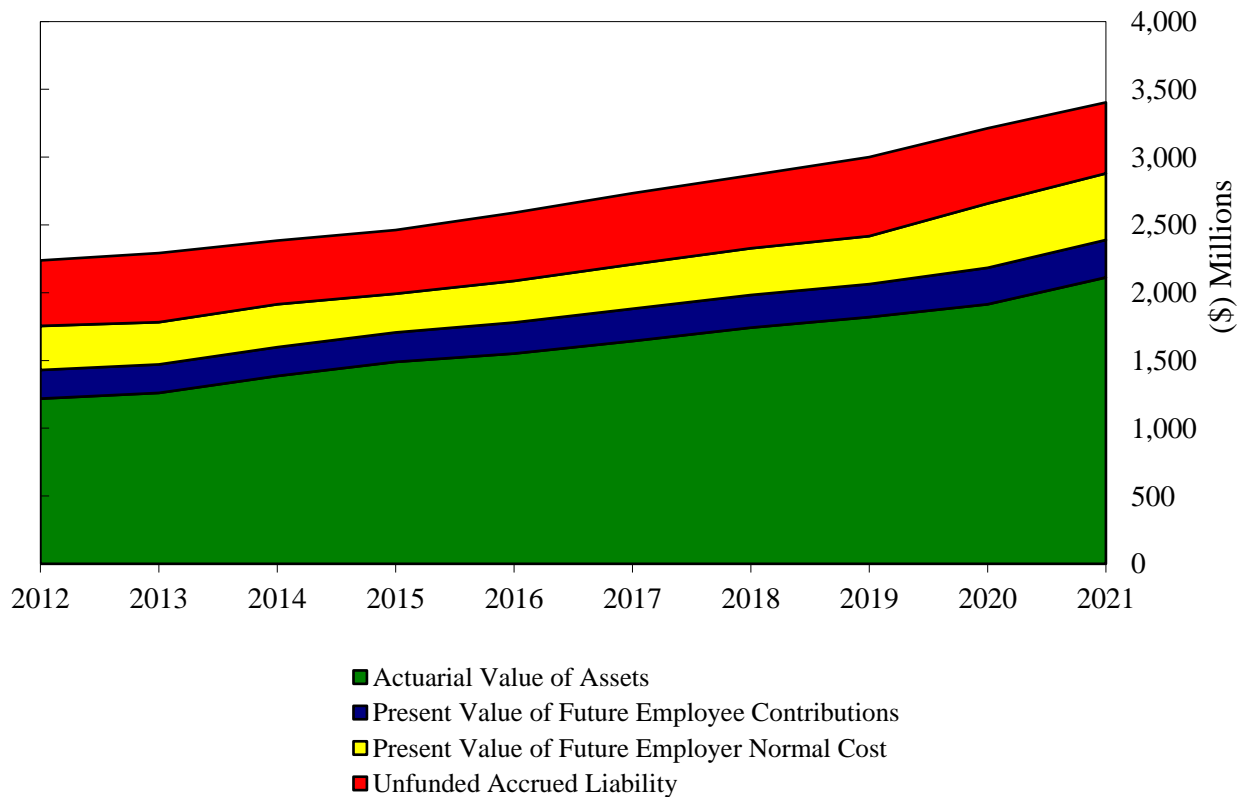
<u>COLA Description</u>	<u>Annual Increase in Benefits</u>	<u>Present Value of Increase</u>	<u>Contribution Cost as a % of Payroll</u>
3% to all allowable pensioners	\$ 3,143,100	\$ 32,458,618	1.17%
2% to pensioners over age 65	\$ 875,507	\$ 7,781,852	0.28%

For Fiscal 2021, the system experienced net actuarial investment earnings of \$54,762,380 above the actuarial assumed earnings rate in effect for Fiscal 2021 of 7.00%. This exceeds the lifetime cost of providing either of the listed cost of living increases.

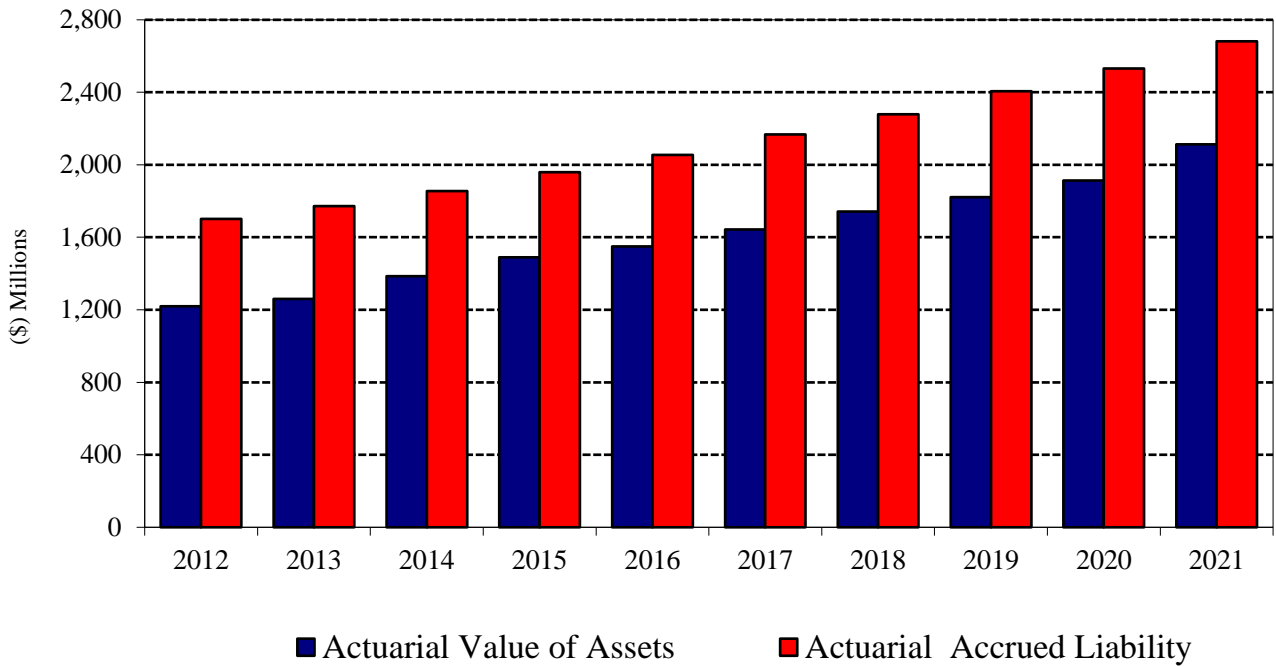
Components of Present Value of Future Benefits June 30, 2021



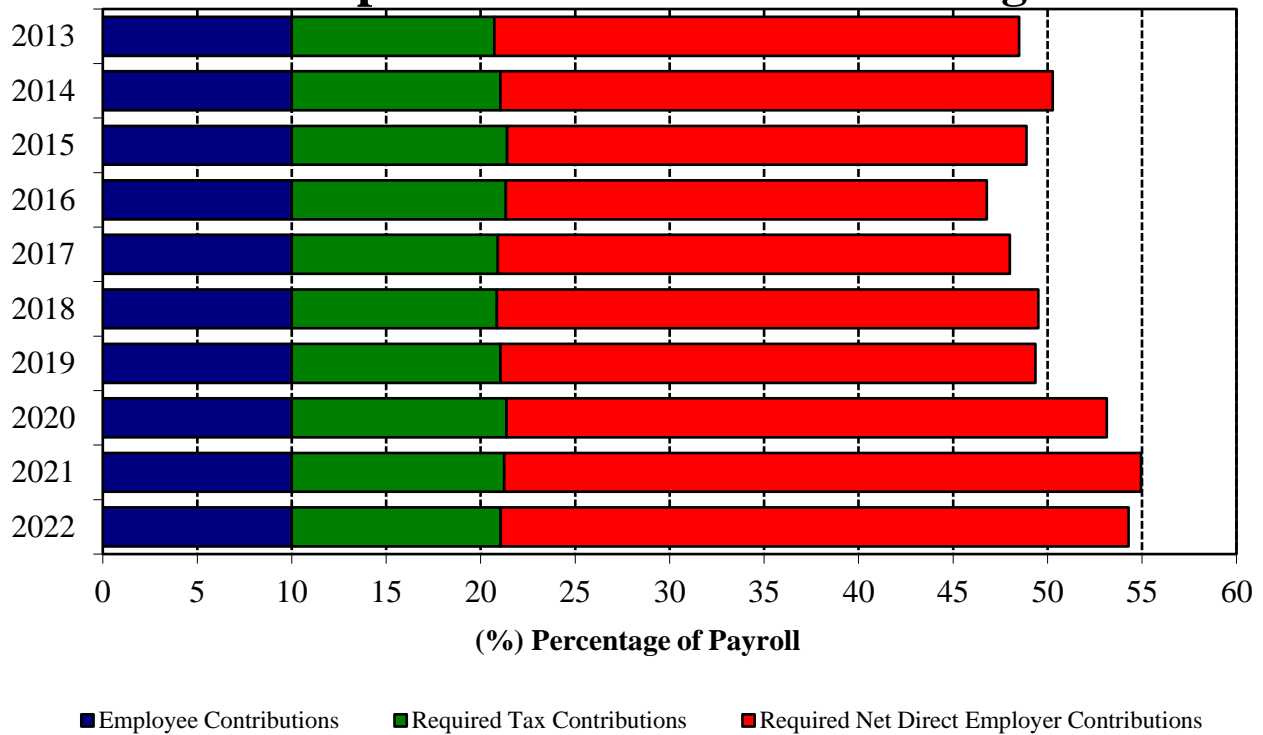
Components of Present Value of Future Benefits Historical



Actuarial Value of Assets vs. Actuarial Accrued Liability

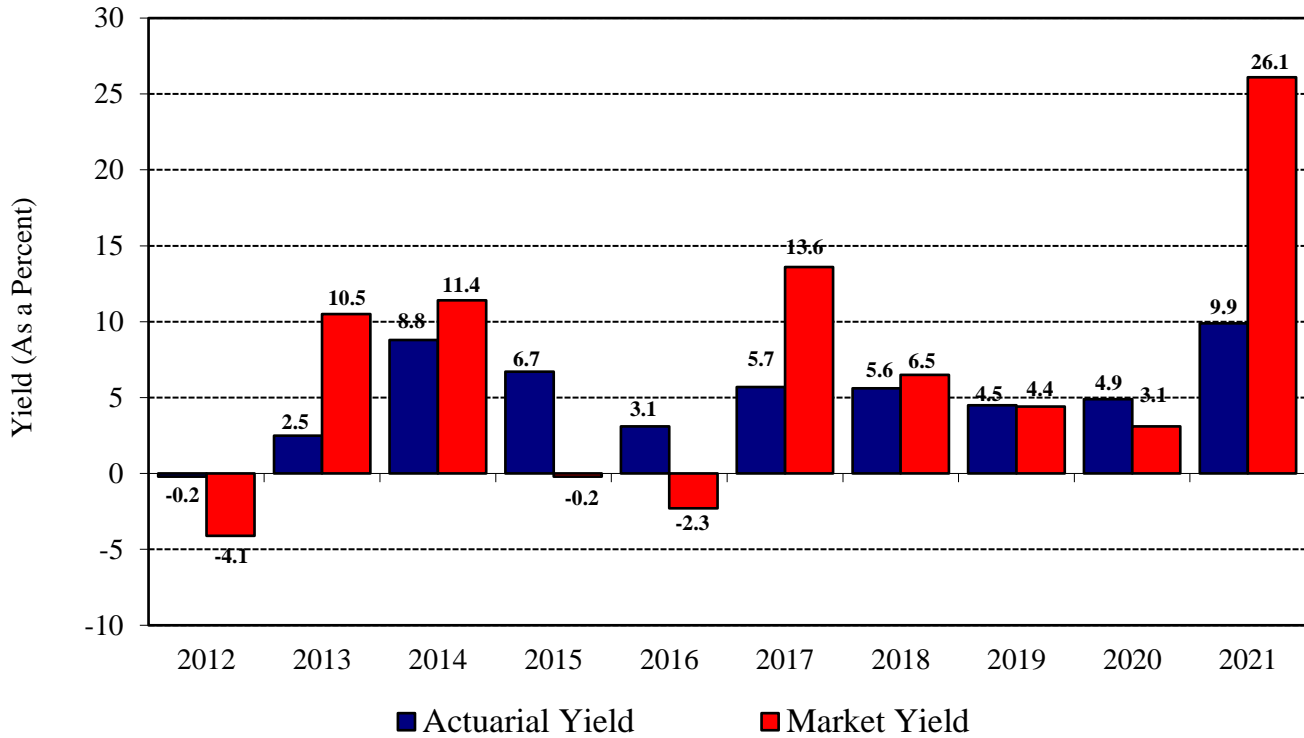


Components of Actuarial Funding

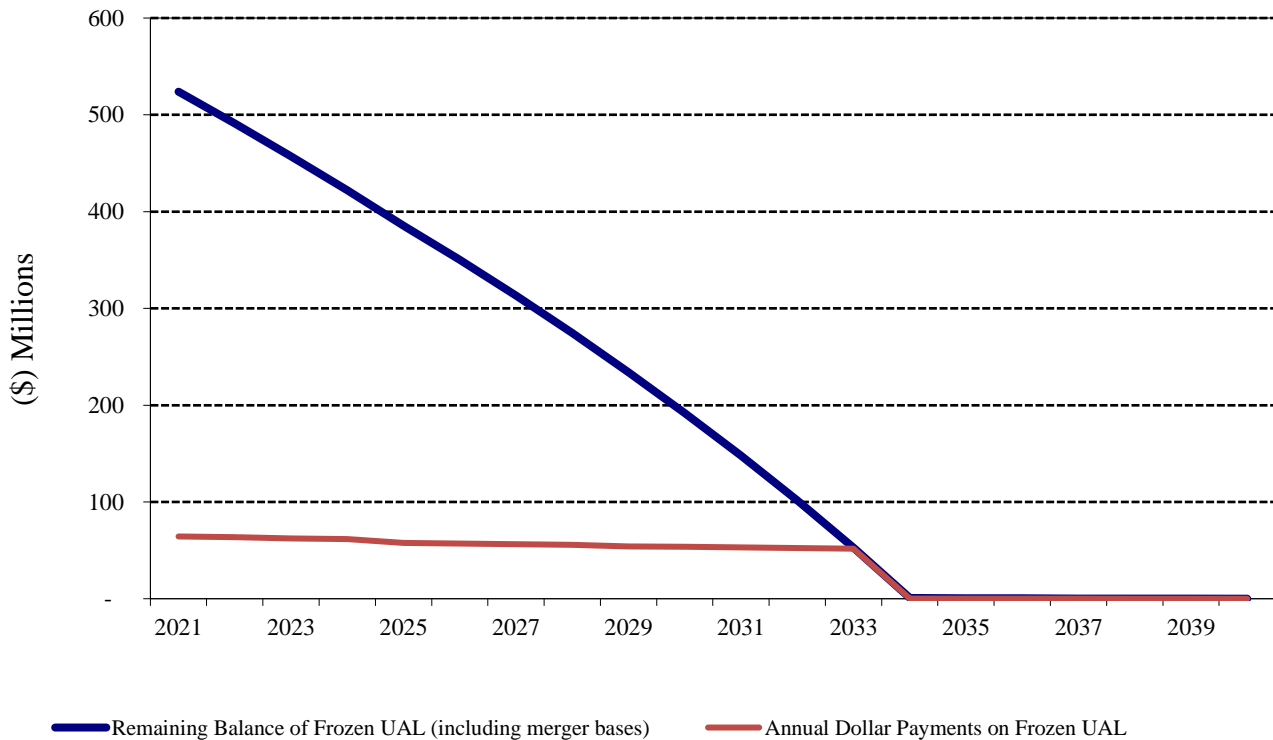


(2012 and later employee contribution level is based on members with earnings above the poverty level)

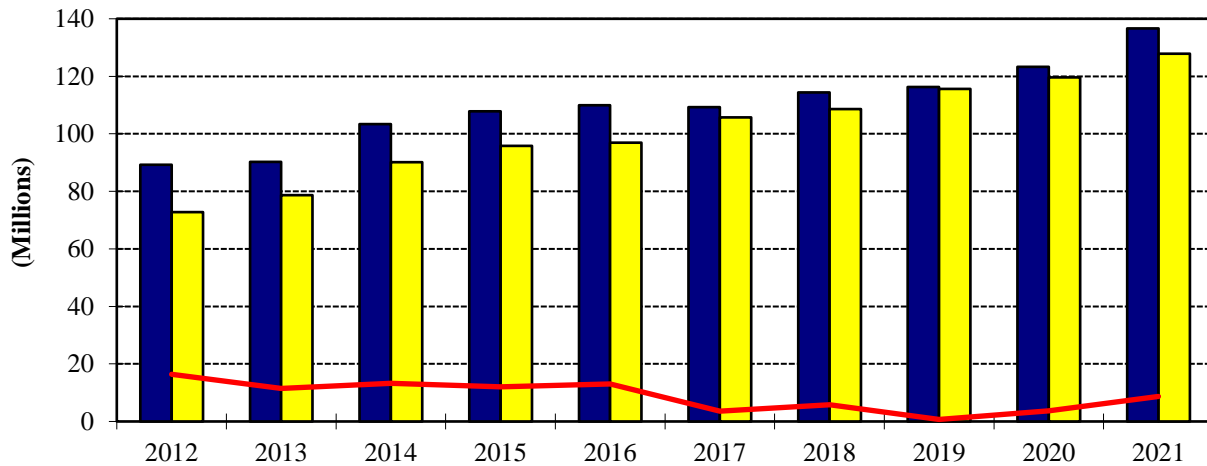
Historical Asset Yields



Frozen Unfunded Actuarial Accrued Liability

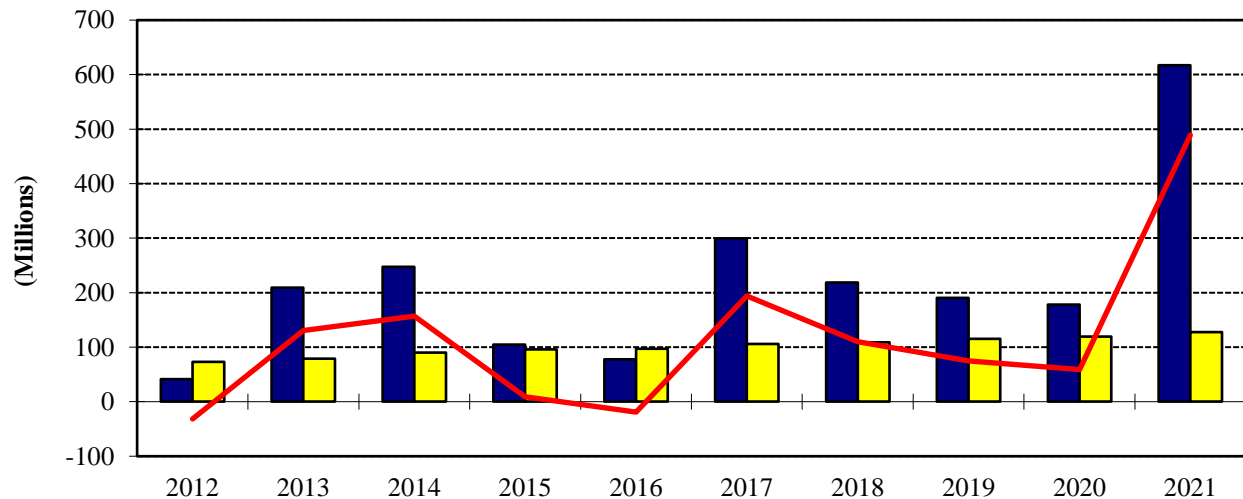


Net Non-Investment Income



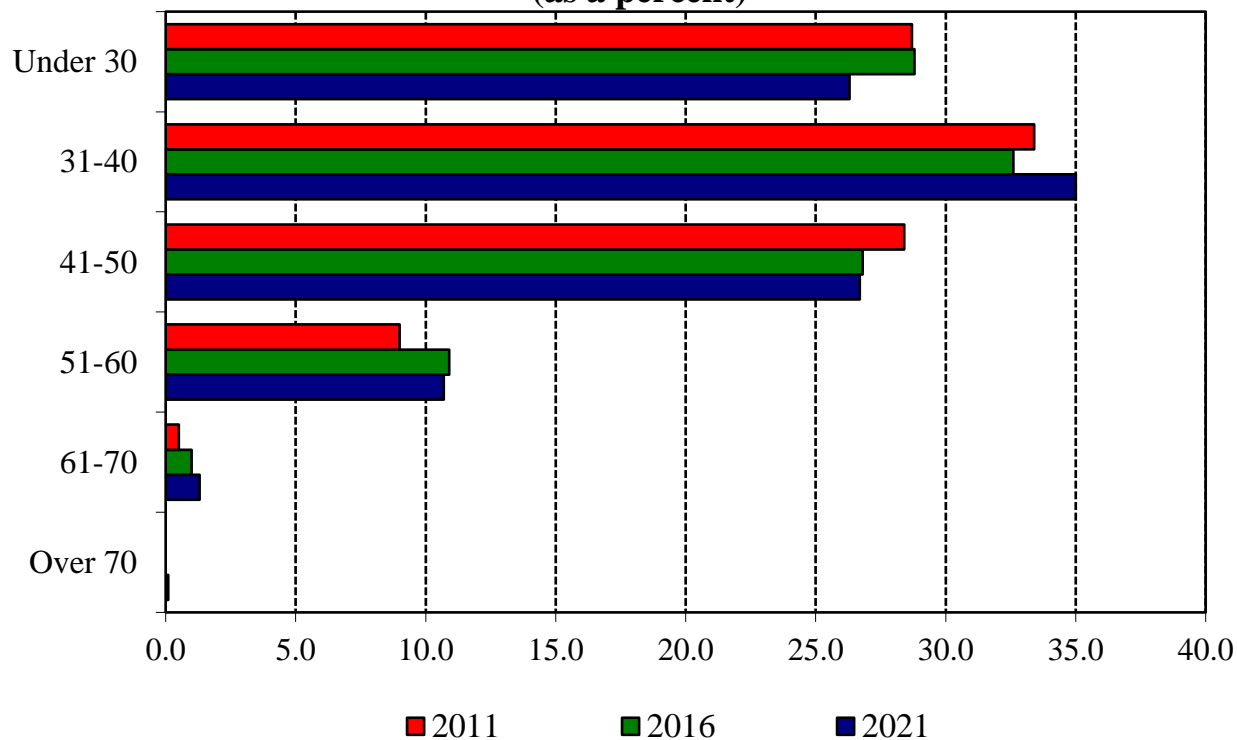
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Non-Investment Income (\$Mil)	■	89.2	90.2	103.4	107.8	109.9	109.3	114.4	116.3	123.3	136.6
Benefits and Expenses (\$Mil)	■	72.8	78.7	90.1	95.8	96.9	105.7	108.6	115.6	119.6	127.9
Net Non-Investment Income (\$Mil)	—	16.4	11.5	13.3	12.0	13.0	3.6	5.8	0.7	3.7	8.7

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

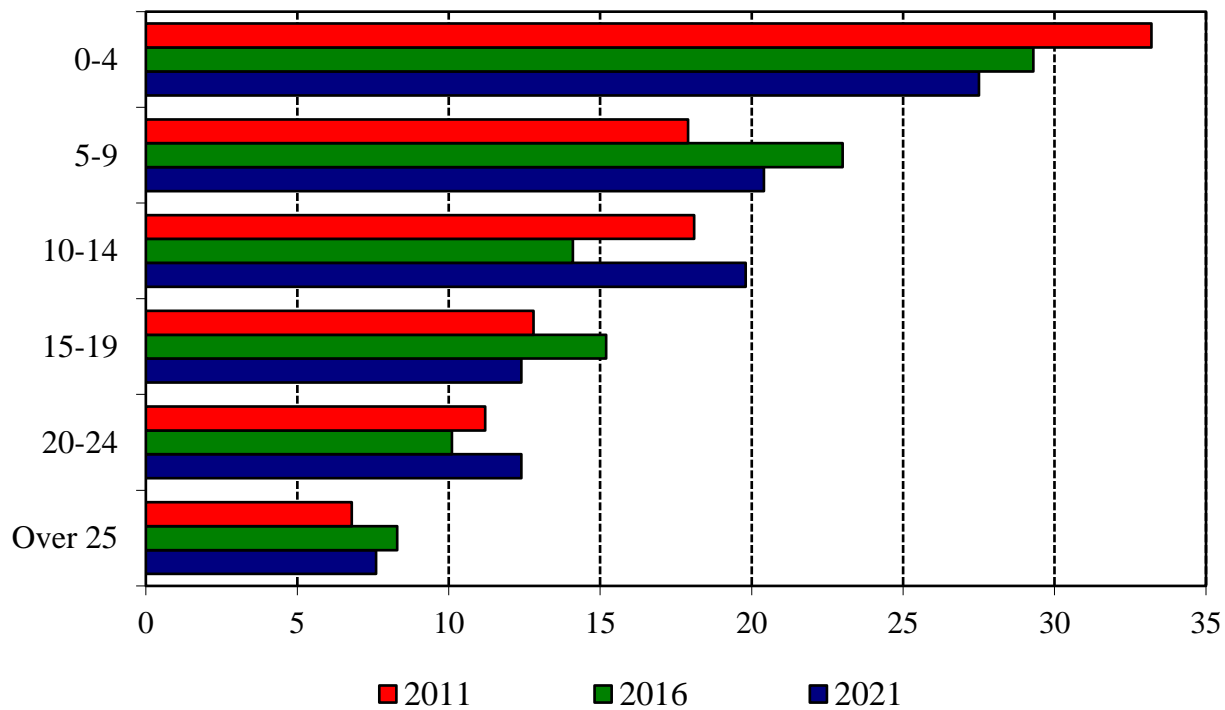


		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total Income (\$Mil)	■	41.2	209.0	247.2	104.6	77.7	299.5	218.9	190.5	178.4	617.0
Benefits and Expenses (\$Mil)	■	72.8	78.7	90.1	95.8	96.9	105.7	108.6	115.6	119.6	127.9
Net Change in MVA (\$Mil)	—	-31.6	130.3	157.1	8.8	-19.2	193.8	110.3	74.9	58.8	489.1

Active – Census by Age (as a percent)



Active – Census by Service (as a percent)



EXHIBITS

EXHIBIT I
ANALYSIS OF ACTUARIALLY REQUIRED CONTRIBUTIONS

1. Present Value of Future Benefits	\$ 3,403,877,879
2. Funding Deposit Account Credit Balance	\$ 0
3. Unfunded Actuarial Accrued Liability	\$ 523,878,929
4. Actuarial Value of Assets	\$ 2,111,737,202
5. Present Value of Future Employee Contributions	\$ 278,140,120
6. Present Value of Future Employer Normal Costs (1 + 2 – 3 – 4 – 5)	\$ 490,121,628
7. Present Value of Future Salaries.....	\$ 2,781,401,197
8. Employer Normal Cost Accrual Rate (6 ÷ 7)	17.621393%
9. Projected Fiscal 2022 Salary for Current Membership	\$ 249,399,508
10. Employer Normal Cost as of July 1, 2021 (8 × 9).....	\$ 43,947,667
11. Employer Normal Cost Interest Adjusted for Mid-year Payment	\$ 45,438,572
12. Amortization Payment on Remaining Frozen Unfunded Accrued Liability ..	\$ 64,349,146
13. Amortization Payment Interest Adjusted for Mid-year Payment	\$ 66,532,163
14. TOTAL Employer Normal Cost and Amortization Payment (11 + 13).....	\$ 111,970,735
15. Estimated Administrative Cost for Fiscal 2022.....	\$ 2,030,080
16. GROSS Employer Actuarially Required Contribution for Fiscal 2022 (14 + 15)	\$ 114,000,815
17. Projected Insurance Premium Taxes for Fiscal 2022	\$ 28,472,051
18. Net Direct Employer Actuarially Required Contribution for Fiscal 2022 (16 – 17)	\$ 85,528,764
19. Projected Payroll for Fiscal 2022	\$ 257,398,495
20. Employers' Minimum Net Direct Actuarially Required Contribution as a % of Projected Payroll for Fiscal 2022 (18 ÷ 19).....	33.23%
21. Board Adopted Employer Contribution Rate for Fiscal 2022	33.75%
22. Contribution Shortfall (Excess) as a Percentage of Payroll (20 – 21).....	(0.52%)
23. Increase (Reduction) to Following Year Payment for Contribution Shortfall (Excess).....	(0.05%)
24. Minimum Recommended Net Direct Employer Contribution Rate for Fiscal 2023 (20 + 23, Rounded to nearest 0.25%)	33.25%

* 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	\$ 1,980,675,447
Survivor Benefits.....	32,016,747
Disability Benefits.....	17,569,466
Vested Termination Benefits.....	22,019,282
Refunds of Contributions	14,016,157

TOTAL Present Value of Future Benefits for Active Members..... \$ 2,066,297,099

PRESENT VALUE OF FUTURE BENEFITS FOR TERMINATED MEMBERS:

Terminated Vested Members Due Benefits at Retirement..	\$ 21,484,122
Terminated Members with Reciprocals	
Due Benefits at Retirement	0
Terminated Members Due a Refund	4,922,747

TOTAL Present Value of Future Benefits for Terminated Members..... \$ 26,406,869

PRESENT VALUE OF FUTURE BENEFITS FOR RETIREES:

Regular Retirees	
Maximum.....	\$ 234,474,442
Option 1	110,115,385
Option 2	537,454,344
Option 3	174,727,594
Option 4	10,956,671

TOTAL Regular Retirees..... \$ 1,067,728,436

Disability Retirees..... 36,308,032

Survivors & Widows..... 79,466,332

DROP Lifetime Annuities..... 1,024,650

DROP Account Balances Payable to Retirees* 122,220,846

IBO Retirees' Account Balance* 4,425,615

TOTAL Present Value of Future Benefits for Retirees & Survivors..... \$ 1,311,173,911

TOTAL PRESENT VALUE OF FUTURE BENEFITS..... \$ 3,403,877,879

*DROP/IBO Balances include estimated interest for Fiscal 2021

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

CURRENT ASSETS:

Cash in Banks	\$ 11,769,357
Contributions Receivable.....	9,412,873
Accrued Interest and Dividends.....	4,667,781
Investments Receivable	647,422
Prepaid Expenses	41,101
Notes Receivable for Mergers.....	781,725

TOTAL CURRENT ASSETS..... \$ 27,320,259

Property Plant & Equipment..... \$ 1,502,563

INVESTMENTS:

Cash held by others for investment.....	\$ 8,016,042
Cash Equivalents.....	47,734,536
Equities	1,269,959,503
Fixed Income	581,897,074
Real Estate	117,049,880
Alternative Investments	110,993,223
Multi-Asset Strategies	165,008,393

TOTAL INVESTMENTS..... \$ 2,300,658,651

DEFERRED OUTFLOWS

\$ 7,436

TOTAL ASSETS

\$ 2,329,488,909

CURRENT LIABILITIES:

Accounts Payable	\$ 1,582,981
Investments Payable.....	425,643
Other Post-Employment Benefits	568,276

TOTAL CURRENT LIABILITIES

\$ 2,576,900

DEFERRED INFLOWS OF RESOURCES

\$ 113,140

TOTAL LIABILITIES.....

\$ 2,690,040

MARKET VALUE OF ASSETS

\$ 2,326,798,869

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

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

Fiscal year 2021	\$ 351,501,915
Fiscal year 2020	(72,248,326)
Fiscal year 2019	(50,158,174)
Fiscal year 2018	(13,637,997)
Fiscal year 2017	85,071,538
Total for five years	\$ 300,528,956

Deferral of excess (shortfall) of invested income:

Fiscal year 2021 (80%)	\$ 281,201,532
Fiscal year 2020 (60%)	(43,348,996)
Fiscal year 2019 (40%)	(20,063,270)
Fiscal year 2018 (20%)	(2,727,599)
Fiscal year 2017 (0%)	0
Total deferred for year	\$ 215,061,667

Market value of plan net assets, end of year..... \$ 2,326,798,869

Preliminary actuarial value of plan assets, end of year \$ 2,111,737,202

Actuarial value of assets corridor

85% of market value, end of year	\$ 1,977,779,039
115% of market value, end of year	\$ 2,675,818,699

Final actuarial value of plan net assets, end of year \$ 2,111,737,202

EXHIBIT IV
PRESENT VALUE OF FUTURE CONTRIBUTIONS

Employee Contributions to the Annuity Savings Fund	\$ 278,140,120
Employer Normal Contributions to the Pension Accumulation Fund.....	490,121,628
Employer Amortization Payments to the Pension Accumulation Fund	523,878,929
TOTAL PRESENT VALUE OF FUTURE CONTRIBUTIONS	\$ 1,292,140,677

EXHIBIT V - SCHEDULE A
ENTRY AGE NORMAL ACTUARIAL ACCRUED LIABILITIES

LIABILITY FOR ACTIVE MEMBERS

Accrued Liability for Retirement Benefits.....	\$ 1,332,003,484
Accrued Liability for Survivor Benefits	11,642,604
Accrued Liability for Disability Benefits.....	3,376,011
Accrued Liability for Vested Termination Benefits.....	8,008,268
Accrued Liability for Refunds of Contributions	(11,427,078)

TOTAL Actuarial Accrued Liability for Active Members..... \$ 1,343,603,289

LIABILITY FOR TERMINATED MEMBERS \$ 26,406,869

LIABILITY FOR RETIREES AND SURVIVORS \$ 1,311,173,911

TOTAL ACTUARIAL ACCRUED LIABILITY (AAL) \$ 2,681,184,069

ACTUARIAL VALUE OF ASSETS (AVA) \$ 2,111,737,202

RATIO OF AVA TO ENTRY AGE NORMAL AAL..... 78.76%

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

Prior Year Frozen Unfunded Accrued Liability \$ 554,826,689

Interest on Frozen Unfunded Accrued Liability \$ 38,837,868

TOTAL Increase in Unfunded Accrued Liability \$ 38,837,868

Amortization Payment on Unfunded Accrued Liability..... \$ 65,220,213

Interest on Amortization Payment \$ 4,565,415

TOTAL Decrease in Unfunded Accrued Liability \$ 69,785,628

NET Change in Unfunded Accrued Liability \$ (30,947,760)

CURRENT YEAR UNFUNDED ACCRUED LIABILITY \$ 523,878,929

EXHIBIT V - SCHEDULE C
AMORTIZATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY - June 30, 2021

FISCAL YEAR	DESCRIPTION	AMORT. PERIOD	INITIAL BALANCE	YEARS REMAINING	REMAINING BALANCE	AMORT. PAYMENTS (BOY)
1993	Merger Loss	30	\$13,485,002	2	\$ 2,012,296	\$1,039,702
1995	Merger Loss	30	41,779,611	4	11,663,985	3,214,000
1996	Merger Loss	30	1,772,399	5	598,568	136,197
1997	Merger Loss	30	890,324	6	349,308	68,342
1998	Merger Loss	30	1,602,435	7	710,368	122,874
1999	Merger Loss	30	14,104,876	8	6,923,545	1,080,432
2001	Merger Loss	30	3,117,590	10	1,797,708	238,327
2007	Merger Loss	30	1,065,812	16	822,271	80,887
2008	Merger Loss	30	1,556,324	17	1,239,246	117,916
2011	Merger Loss	30	329,132	20	283,293	24,821
2019	Cumulative Non-Merger Bases	15	549,175,053	13	497,478,341	58,225,648

TOTAL Frozen Unfunded Actuarial Accrued Liability as of July 1, 2021	\$ 523,878,929
TOTAL Fiscal 2022 Amortization Payments on July 1, 2021	\$ 64,349,146
TOTAL Fiscal 2022 Amortization Payments Adjusted to Mid-Year	\$ 66,532,163

Sum of Remaining Balances and Amortization Payments may not equal total UAL or payments due to rounding

EXHIBIT VI
ANALYSIS OF CHANGE IN ASSETS

Actuarial Value of Assets (June 30, 2020)		\$ 1,914,024,117
INCOME:		
Member Contributions	\$ 25,163,688	
Employer Contributions	81,160,192	
Insurance Premium Taxes	28,567,787	
Transfers From Other Systems.....	1,682,932	
Total Contributions		\$ 136,574,599
Net Appreciation of Investments	\$ 467,121,801	
Interest & Dividends	21,756,385	
Legal Settlement	2,764	
Investment Expense	(8,442,418)	
Net Investment Income		\$ 480,438,532
TOTAL Income		\$ 617,013,131
EXPENSES:		
Retirement Benefits (Including DROP)	\$ 124,061,952	
Refunds of Contributions	1,658,028	
Transfers to Other Systems	456,138	
Administrative Expenses (Includes OPEB)	1,727,805	
TOTAL Expenses		\$ 127,903,923
Net Market Value Income for Fiscal 2021 (Income - Expenses)		\$ 489,109,208
Unadjusted Assets as of June 30, 2021 (Assets Previous Year + Net Income)		\$ 2,403,133,325
Adjustment for Actuarial Smoothing.....		\$ (291,396,123)
Actuarial Value of Assets: (June 30, 2021).....		\$ 2,111,737,202

EXHIBIT VII
PENSION BENEFIT OBLIGATION

Present Value of Credited Projected Benefits Payable to Current Employees.....	\$ 1,283,605,807
Present Value of Benefits Payable to Terminated Employees	26,406,869
Present Value of Benefits Payable to Current Retirees and Beneficiaries	1,311,173,911
 TOTAL PENSION BENEFIT OBLIGATION	 \$ 2,621,186,587
 NET ACTUARIAL VALUE OF ASSETS	 \$ 2,111,737,202
 Ratio of Net Actuarial Value of Assets to Pension Benefit Obligation.....	 80.56%

**EXHIBIT VIII
CENSUS DATA**

	Active	Terminated with Funds on Deposit	DROP	Retired	Total
Number of members as of June 30, 2020	4,426	848	220	2,497	7,991
Additions to Census					
Initial membership	304	33			337
Omitted in error last year				2	2
Death of another member				25	25
Adjustment for multiple records					
Change in Status during Year					
Actives terminating service	(122)	122			
Actives who retired	(51)			51	
Actives entering DROP	(104)		104		
Term. members rehired	26	(26)			
Term. members who retire		(10)		10	
Retirees who are rehired					
Refunded who are rehired	10	2			12
DROP participants retiring			(68)	68	
DROP returned to work	13		(13)		
Omitted in error last year					
Eliminated from Census					
Refund of contributions	(50)	(57)			(107)
Deaths	(2)	(2)	(2)	(75)	(81)
Included in error last year					
Adjustment for multiple records					
Number of members as of June 30, 2021	4,450	910	241	2,578	8,179

ACTIVES CENSUS BY AGE:

Age	Number Male	Number Female	Total Number	Average Salary	Total Salary
16 - 20	58	1	59	32,306	1,906,048
21 - 25	410	15	425	37,723	16,032,407
26 - 30	640	47	687	43,423	29,831,779
31 - 35	787	41	828	49,381	40,887,161
36 - 40	689	40	729	56,254	41,008,834
41 - 45	596	47	643	62,940	40,470,427
46 - 50	508	37	545	70,785	38,577,962
51 - 55	302	27	329	74,647	24,558,900
56 - 60	126	19	145	74,778	10,842,851
61 - 65	39	10	49	79,492	3,895,116
66 - 70	7	1	8	100,182	801,458
71 - 75	2	0	2	125,279	250,558
76 - 80	1	0	1	95,809	95,809
TOTAL	4,165	285	4,450	55,991	249,159,310

THE ACTIVE CENSUS INCLUDES 2,192 ACTIVES WITH VESTED BENEFITS, INCLUDING 59 ACTIVE FORMER DROP PARTICIPANTS. THE 241 CURRENT DROP PARTICIPANTS ARE EXCLUDED.

DROP PARTICIPANTS:

Age	Number Male	Number Female	Total Number	Average Benefit	Total Benefit
46 - 50	28	2	30	65,445	1,963,360
51 - 55	102	6	108	69,345	7,489,295
56 - 60	69	4	73	64,554	4,712,422
61 - 65	22	3	25	61,677	1,541,929
66 - 70	4	1	5	65,570	327,852
TOTAL	225	16	241	66,535	16,034,858

TERMINATED MEMBERS DUE A DEFERRED RETIREMENT BENEFIT:

Age	Number Male	Number Female	Total Number	Average Benefit	Total Benefit
31 - 35	3	0	3	20,713	62,138
36 - 40	13	2	15	24,696	370,437
41 - 45	32	4	36	29,116	1,048,180
46 - 50	25	0	25	27,820	695,506
51 - 55	16	1	17	23,159	393,706
56 - 60	3	0	3	102,797	308,391
TOTAL	92	7	99	29,074	2,878,358

TERMINATED MEMBERS DUE A REFUND OF CONTRIBUTIONS:

Contributions Ranging From	To	Number	Total Contributions
0	99	69	3,490
100	499	200	51,642
500	999	86	60,078
1,000	1,999	83	118,265
2,000	4,999	125	407,357
5,000	9,999	95	698,984
10,000	19,999	81	1,148,395
20,000	99,999	71	2,297,053
100,000	& Above	1	107,007
TOTAL		811	4,892,271

This total excludes 1 deceased member whose family is due a refund of \$30,476 in employee contributions

REGULAR RETIREES:

Age	Number Male	Number Female	Total Number	Average Benefit	Total Benefit
41 - 45	1	0	1	59,470	59,470
46 - 50	36	3	39	51,781	2,019,447
51 - 55	135	8	143	49,744	7,113,428
56 - 60	408	20	428	53,511	22,902,854
61 - 65	454	24	478	51,784	24,752,700
66 - 70	354	15	369	47,586	17,559,244
71 - 75	287	7	294	40,745	11,979,022
76 - 80	145	4	149	36,853	5,491,063
81 - 85	83	0	83	36,561	3,034,555
86 - 90	25	0	25	29,618	740,443
91 - 99	19	0	19	26,013	494,239
TOTAL	1,947	81	2,028	47,409	96,146,465

DISABILITY RETIREES:

Age	Number Male	Number Female	Total Number	Average Benefit	Total Benefit
26 - 30	1	0	1	11,694	11,694
36 - 40	1	0	1	17,883	17,883
41 - 45	8	1	9	27,287	245,584
46 - 50	18	2	20	28,547	570,941
51 - 55	21	1	22	24,646	542,208
56 - 60	12	2	14	25,242	353,383
61 - 65	21	3	24	20,236	485,660
66 - 70	18	1	19	21,915	416,377
71 - 75	11	1	12	21,899	262,787
76 - 80	7	0	7	17,875	125,122
81 - 85	6	0	6	11,479	68,875
86 - 90	5	0	5	19,231	96,157
TOTAL	129	11	140	22,833	3,196,671

SURVIVORS:

Age	Number Male	Number Female	Total Number	Average Benefit	Total Benefit
0 - 25	20	24	44	5,699	250,766
26 - 30	0	1	1	1,638	1,638
31 - 35	0	3	3	20,748	62,244
36 - 40	1	8	9	29,392	264,529
41 - 45	3	7	10	24,093	240,933
46 - 50	1	14	15	30,518	457,765
51 - 55	0	15	15	27,645	414,672
56 - 60	1	24	25	30,321	758,032
61 - 65	1	32	33	28,630	944,798
66 - 70	2	36	38	28,945	1,099,920
71 - 75	0	54	54	21,190	1,144,256
76 - 80	1	46	47	24,314	1,142,744
81 - 85	0	47	47	18,820	884,559
86 - 90	0	44	44	20,014	880,636
91 - 99	0	25	25	14,859	371,465
TOTAL	30	380	410	21,754	8,918,957

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	48	11										59
21 - 25	141	93	75	58	30	28						425
26 - 30	61	72	80	69	81	297	27					687
31 - 35	35	38	47	43	64	296	291	14				828
36 - 40	16	16	28	18	25	156	288	172	10			729
41 - 45	8	5	10	8	15	67	150	174	198	8		643
46 - 50	2	5	6	3	3	35	65	107	223	92	4	545
51 - 55		2	1	1	4	20	34	53	81	107	26	329
56 - 60		1	1			8	18	22	30	26	39	145
61 - 65		1					7	8	8	7	19	49
66 - 70								1	1	1	5	8
71 & Over											3	3
Totals	311	243	248	200	222	907	880	551	551	241	96	4,450

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	31,508	35,786										32,306
21 - 25	32,285	36,326	41,193	41,152	44,269	46,339						37,723
26 - 30	32,862	37,005	40,765	42,734	44,565	47,001	51,263					43,423
31 - 35	34,026	40,511	43,304	43,710	45,494	49,203	54,690	60,828				49,381
36 - 40	37,669	37,055	40,725	44,138	46,830	51,313	57,976	65,870	67,627			56,254
41 - 45	38,003	38,493	42,136	45,330	42,755	50,670	59,553	65,383	71,702	80,894		62,940
46 - 50	36,813	47,893	62,577	58,389	46,463	51,136	59,176	67,984	74,918	83,201	75,794	70,785
51 - 55		52,891	22,710	31,848	53,051	54,431	60,658	66,705	78,202	82,344	90,572	74,647
56 - 60		179,992	60,866			50,403	55,537	66,659	74,272	82,615	86,064	74,778
61 - 65							56,741	49,495	73,628	95,563	97,053	79,492
66 - 70								98,477	43,294	73,691	117,199	100,182
71 & Over											115,456	115,456
Average	32,928	38,215	41,962	42,896	45,104	49,065	57,085	65,932	74,001	83,000	91,572	55,991

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									3			3
36 - 40								15				15
41 - 45							31					31
46 - 50	1			1	2	5						36
51 - 55	1	2	7	5	2	21						25
56 - 60	3											17
61 & Over												3
Totals	5	2	7	6	4	26	31	15	3	0	0	99

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									20,713			20,713
36 - 40								24,696				24,696
41 - 45						40,124	27,341					29,116
46 - 50	73,304			54,830	39,780	23,229						27,820
51 - 55	29,240	21,604	21,215	27,928	16,556							23,159
56 - 60	102,797											102,797
61 & Over												0
Average	82,187	21,604	21,215	32,412	28,168	26,478	27,341	24,696	20,713	0	0	29,074

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	18	14	4	1	3									40
51 - 55	26	23	28	10	23	29	4							143
56 - 60	56	47	41	38	37	152	49	8						428
61 - 65	18	13	24	17	27	201	138	39	1					478
66 - 70	3	7	9	8	6	86	107	110	25	8				369
71 - 75			2	3	2	13	42	92	106	24	10			294
76 - 80						2	10	22	49	45	21			149
81 - 85						2	1	3	12	26	39			83
86 - 90								1	1		23			25
91 & Over								1	1		18			19
Totals	121	104	108	77	98	485	351	275	195	103	111			2,028

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	49,775	54,678	57,228	42,012	48,852									51,973
51 - 55	52,882	49,615	50,403	53,998	46,641	47,291	50,485							49,744
56 - 60	61,028	56,483	56,622	63,439	51,312	51,255	44,824	26,593						53,511
61 - 65	57,541	53,399	68,461	58,564	66,047	53,963	44,477	40,661	30,629					51,784
66 - 70	58,792	51,212	61,617	55,594	59,048	56,488	44,530	44,607	37,754	24,696				47,586
71 - 75			43,016	41,762	66,205	50,675	44,261	41,354	40,761	30,039	27,145			40,745
76 - 80						34,188	43,622	36,904	40,406	36,905	25,427			36,853
81 - 85						46,297	30,747	57,317	42,270	43,774	28,049			36,561
86 - 90								19,390	61,769	28,665	23,883			29,618
91 & Over									64,344					26,013
Average	57,029	53,981	57,827	59,199	54,977	52,962	44,521	41,866	40,556	36,091	26,923			47,409

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 - 30		1											1
31 - 35													0
36 - 40	1												1
41 - 45	3	1			4	4	4	1					9
46 - 50	2	2	1	2	4	6	5	5	2				20
51 - 55			2		6	2	3	3	3				22
56 - 60					2	3	1	8	5				14
61 - 65					3	3	1	1	4		3		24
66 - 70					1	1	1	2	4		1		19
71 - 75								1	2		4		12
76 - 80									2		1		7
81 - 85									2		4		6
86 - 90									2		4		6
91 & Over										1	4		5
Totals	6	4	3	2	4	20	17	21	20	13	30		140

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 - 30		11,694											11,694
31 - 35													0
36 - 40	17,883												17,883
41 - 45	31,625	38,173			24,373	20,390	15,044	8,354					27,287
46 - 50	24,766	40,008	31,943	39,718	26,575	28,036	15,605	15,605	16,354	17,180			28,547
51 - 55			35,874		29,055	25,394	30,029	27,495	17,036	15,560			24,646
56 - 60					34,829	19,788	31,467	26,091	12,515	15,932			25,242
61 - 65					28,097	22,691	26,091	20,310	18,401	28,346	11,773		20,236
66 - 70					42,439		26,091	20,310	26,418	20,310	18,637		21,915
71 - 75							11,668	17,762	11,668	17,762	21,006		21,899
76 - 80							9,396	36,337	9,396	36,337	12,521		17,875
81 - 85													11,479
86 - 90													19,231
91 & Over													0
Average	27,048	32,471	34,563	39,718	26,575	30,101	24,660	23,833	15,748	20,012	17,274		22,833

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		6	2	7	2	5	9	1	1	2		35
21 - 25			1	3			4	1				9
26 - 30							1					1
31 - 35		1		1		1						3
36 - 40		1			2		3					9
41 - 45			1	2		1	2	1	1	1	1	10
46 - 50	2			1		2	4	2	2	1		15
51 - 55						2	6	2	3	1		15
56 - 60						7	5	4	5	3		25
61 - 65		1				4	10	9	5	2	2	33
66 - 70		1			1	1	4	7	11	5	8	38
71 - 75		1			1	3	2	6	20	9	12	54
76 - 80								5	17	8	17	47
81 - 85								2	5	4	36	47
86 - 90									3	3	38	44
91 & OVER										2	23	25
TOTALS	2	11	8	14	6	27	50	41	73	41	137	410

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	4,353	7,112	10,161	6,999	6,175	5,644	5,257	4,032	3,756	5,836		5,619
21 - 25				7,517			4,463	3,519				6,009
26 - 30							1,638					1,638
31 - 35	21,009	54,469	15,617	19,013	28,433	22,222	14,457	34,830				20,748
36 - 40		20,289		37,934		59,376	21,199	24,679	15,635	35,014	1,791	29,392
41 - 45		80,864		38,590		25,259	23,403	19,024	14,628	11,119		24,093
46 - 50	35,629	34,033				47,511	36,218	7,995	19,458	12,585		30,518
51 - 55		26,374				38,191	28,654	27,825	14,793	12,096		27,645
56 - 60						52,405	30,115	31,664	16,741	21,608		30,321
61 - 65		40,668				42,974	34,558	32,158	23,133	27,100	9,595	28,630
66 - 70		55,571			86,771	63,657	35,340	22,225	21,754	21,794	17,578	28,945
71 - 75		30,481			15,421	34,483		44,063	26,290	27,668	13,304	21,190
76 - 80								35,197	10,202	14,950	18,395	24,314
81 - 85									29,289	25,234	18,395	18,820
86 - 90									21,308	28,521	18,611	20,014
91 & OVER										21,308	14,298	14,859
AVERAGE	35,629	17,224	30,052	14,644	28,568	37,493	22,337	28,452	21,096	22,732	16,596	21,754

EXHIBIT IX YEAR-TO-YEAR COMPARISON

	Fiscal 2021	Fiscal 2020	Fiscal 2019	Fiscal 2018
Number of Active Members	4,450	4,426	4,446	4,424
Number of Retirees & Survivors	2,578	2,497	2,407	2,327
DROP Participants	241	220	208	192
Number of Terminated Due Deferred Benefits	99	85	84	76
Number Terminated Due Refunds	811	763	671	656
Active Lives Payroll (excludes DROP participants)	\$ 249,159,310	\$ 245,786,834	\$ 240,413,972	\$ 236,005,445
Retiree Benefits in Payment	\$ 108,262,093	\$ 102,305,923	\$ 97,547,088	\$ 91,808,883
Market Value of Assets	\$ 2,326,798,869	\$ 1,837,689,661	\$ 1,778,931,314	\$ 1,704,049,168
Ratio of Actuarial Value of Assets to Actuarial Accrued Liability	78.76%	75.63%	75.72%	76.40%
Actuarial Accrued Liability (EAN)	\$ 2,681,184,069	\$ 2,530,844,605	\$ 2,405,122,324	\$ 2,279,256,967
Actuarial Value of Assets	\$ 2,111,737,202	\$ 1,914,024,117	\$ 1,821,040,904	\$ 1,741,451,961
UAL (Funding Excess)	\$ 523,878,929	\$ 554,826,689	\$ 584,081,420	\$ 537,805,006
P.V. of Future Employer Normal Contributions	\$ 490,121,628	\$ 475,561,988	\$ 352,991,474	\$ 346,076,765
Present Value of Future Employee Contrib.	\$ 278,140,120	\$ 269,628,321	\$ 243,350,511	\$ 240,713,969
Present Value of Future Benefits	\$ 3,403,877,879	\$ 3,214,041,115	\$ 3,001,464,309	\$ 2,866,047,701
	Fiscal 2022	Fiscal 2021	Fiscal 2020	Fiscal 2019
Employee Contribution Rate Above Poverty Level	10.00%	10.00%	10.00%	10.00%
Required Tax Contributions as a Percentage of Projected Payroll	11.06%	11.25%	11.38%	11.04%
Actuarially Required Employer Contribution as a Percentage of Projected Payroll	33.23%	33.69%	31.78%	28.32%
Actual Employer Contribution as a Percentage of Projected Payroll	33.75%	32.25%	27.75%	26.50%

The above employee and employer contribution 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 2017	Fiscal 2016	Fiscal 2015	Fiscal 2014	Fiscal 2013	Fiscal 2012
4,429	4,362	4,192	4,098	4,063	4,056
2,289	2,213	2,139	2,057	1,958	1,875
173	173	166	185	221	217
72	72	81	9	71	70
597	558	523	472	450	398
\$ 232,500,397	\$ 225,301,112	\$ 211,963,892	\$ 203,333,976	\$ 199,129,982	\$ 198,112,999
\$ 88,444,685	\$ 83,899,034	\$ 79,924,818	\$ 73,404,453	\$ 67,678,016	\$ 62,975,274
\$ 1,593,696,648	\$ 1,399,892,212	\$ 1,419,138,769	\$ 1,410,307,198	\$ 1,253,213,084	\$ 1,122,864,548
75.82%	75.48%	76.09%	74.66%	71.13%	71.66%
\$ 2,166,881,556	\$ 2,053,982,618	\$ 1,958,850,006	\$ 1,855,298,538	\$ 1,771,931,777	\$ 1,700,643,083
\$ 1,643,007,075	\$ 1,550,261,745	\$ 1,490,408,510	\$ 1,385,135,204	\$ 1,260,348,240	\$ 1,218,618,308
\$ 523,874,481	\$ 503,720,873	\$ 468,441,496	\$ 470,163,334	\$ 511,583,537	\$ 482,024,775
\$ 328,942,059	\$ 305,570,473	\$ 286,640,979	\$ 315,734,786	\$ 310,702,226	\$ 325,616,184
\$ 238,106,260	\$ 230,423,085	\$ 216,351,986	\$ 213,279,261	\$ 210,842,508	\$ 211,015,125
\$ 2,733,929,875	\$ 2,589,976,176	\$ 2,461,842,971	\$ 2,384,312,585	\$ 2,294,778,794	\$ 2,223,486,329

Fiscal 2018	Fiscal 2017	Fiscal 2016	Fiscal 2015	Fiscal 2014	Fiscal 2013
10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
10.85%	10.91%	11.33%	11.39%	11.05%	10.72%
28.67%	27.09%	25.44%	27.50%	29.23%	27.77%
26.50%	25.25%	27.25%	29.25%	28.25%	24.00%

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, 11:105, 11:107 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.

AVERAGE FINAL COMPENSATION – The average annual earned compensation of an employee for any period of thirty-six successive or joined months of service as an employee during which the said earned compensation was the highest. In case of interruption of employment, the thirty-six month period shall be computed by joining employment periods immediately preceding and succeeding the interruption. The earnings to be considered for the thirteenth through the twenty-fourth months shall not exceed one hundred fifteen percent of the earnings for the first through the twelfth months. The earnings to be considered for the final twelve months shall not exceed one hundred fifteen percent of the earnings of the thirteenth through the twenty-fourth months.

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 based on a formula equal to up to \$1 times the total of the number of years of credited service accrued at retirement or at death of the member or retiree plus the number of years since retirement or since death of the member or retiree to the system's fiscal year end preceding the payment of the benefit 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:	 Frozen Initial Liability Actuarial Cost Method with allocation of cost based on earnings. The frozen unfunded accrued liability was calculated using the Individual Entry Age Normal Method.
 VALUATION INTEREST RATE:	 6.90% (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 MEMBER MORTALITY:	 Pub-2010 Public Retirement Plans Mortality Table for Safety Below-Median Employees multiplied by 105% for males and 115% for females, each with full generational projection using the MP2019 scale.

ANNUITANT AND BENEFICIARY MORTALITY:	Pub-2010 Public Retirement Plans Mortality Table for Safety Below-Median Healthy Retirees multiplied by 105% for males and 115% for females, each with full generational projection using the MP2019 scale.						
DISABLED LIVES MORTALITY:	Pub-2010 Public Retirement Plans Mortality Table for Safety Disabled Retirees multiplied by 105% for males and 115% for females, each with full generational projection using the MP2019 scale.						
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 2.5% inflation and merit increases. The gross rates including inflation and merit increases are as follows: <table border="0" style="margin-left: 40px;"> <tr> <td style="padding-right: 20px;">Years of Service</td> <td>Salary Growth Rate</td> </tr> <tr> <td style="padding-right: 20px;">1 – 2</td> <td>14.10%</td> </tr> <tr> <td style="padding-right: 20px;">3 & over</td> <td>5.20%</td> </tr> </table>	Years of Service	Salary Growth Rate	1 – 2	14.10%	3 & over	5.20%
Years of Service	Salary Growth Rate						
1 – 2	14.10%						
3 & over	5.20%						
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 75% are assumed to retire at the end of this participation period with 25% assumed to work 2 years post-DROP and then retire.						
RETIREMENT RATES FOR ACTIVE FORMER DROP PARTICIPANTS:	The rates of retirement for active former DROP participants are included later in this report.						
DISABILITY RATES:	75% of the disability rates used for the 27 th 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.						

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

<u>Service Duration ≤</u>	<u>Factor</u>	<u>Service Duration ≤</u>	<u>Factor</u>
1	0.095	9	0.029
2	0.079	10	0.025
3	0.066	11	0.022
4	0.055	12	0.018
5	0.047	13	0.015
6	0.040	14	0.013
7	0.036	15	0.010
8	0.032	16 & Over	0.005

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 2019 Table F1: Family Households, by Type, Age of Own Children, Age of Family Members, and Age of Householder provided by the U.S. Census Bureau:

<u>Member's Age</u>	<u>% With Children</u>	<u>Number of Children</u>	<u>Average Age</u>
25	60%	1.77	4
35	82%	2.11	8
45	63%	1.75	11
55	11%	1.42	14
65	2%	1.50	14

IN THE LINE OF DUTY DISABILITY: 20% of Total Disabilities

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

ACTUARIAL TABLES AND RATES

Age	Retirement Rates	DROP Entry Rates	Post-DROP Retirement Rates	Disability Rates
18	0.000000	0.000000	0.000000	0.000900
19	0.000000	0.000000	0.000000	0.000900
20	0.000000	0.000000	0.000000	0.000900
21	0.000000	0.000000	0.000000	0.000900
22	0.000000	0.000000	0.000000	0.000900
23	0.000000	0.000000	0.000000	0.000900
24	0.000000	0.000000	0.000000	0.000900
25	0.000000	0.000000	0.000000	0.000900
26	0.000000	0.000000	0.000000	0.000900
27	0.000000	0.000000	0.000000	0.000900
28	0.000000	0.000000	0.000000	0.000900
29	0.000000	0.000000	0.000000	0.000900
30	0.000000	0.000000	0.000000	0.000900
31	0.000000	0.000000	0.000000	0.000900
32	0.000000	0.000000	0.000000	0.000900
33	0.000000	0.000000	0.000000	0.000900
34	0.000000	0.000000	0.000000	0.000900
35	0.000000	0.000000	0.000000	0.000980
36	0.000000	0.000000	0.000000	0.000980
37	0.000000	0.000000	0.000000	0.000980
38	0.000000	0.000000	0.000000	0.001050
39	0.000000	0.000000	0.000000	0.001130
40	0.000000	0.000000	0.000000	0.001200
41	0.020000	0.000000	0.000000	0.001280
42	0.020000	0.000000	0.000000	0.001350
43	0.040000	0.000000	0.000000	0.001500
44	0.060000	0.050000	0.000000	0.001580
45	0.070000	0.060000	0.000000	0.001800
46	0.070000	0.070000	0.000000	0.001950
47	0.070000	0.080000	0.000000	0.002180
48	0.060000	0.090000	0.040000	0.002480
49	0.050000	0.100000	0.040000	0.002850
50	0.050000	0.120000	0.100000	0.003230
51	0.040000	0.130000	0.150000	0.003680
52	0.040000	0.150000	0.190000	0.004280
53	0.040000	0.170000	0.230000	0.004950
54	0.040000	0.180000	0.250000	0.005780
55	0.040000	0.190000	0.270000	0.006750
56	0.040000	0.210000	0.270000	0.007950
57	0.040000	0.220000	0.270000	0.009380
58	0.040000	0.230000	0.270000	0.011100
59	0.050000	0.230000	0.260000	0.013130
60	0.060000	0.230000	0.250000	0.017930
61	0.070000	0.220000	0.240000	0.021830
62	0.080000	0.200000	0.230000	0.024150
63	0.100000	0.200000	0.230000	0.025350
64	0.120000	0.200000	0.240000	0.019280
65	0.140000	0.200000	0.250000	0.015530
66	0.170000	0.200000	0.250000	0.003900
67	0.210000	0.200000	0.260000	0.003900
68	0.250000	0.200000	0.260000	0.003900
69	0.300000	0.200000	0.250000	0.003900
70	0.500000	0.000000	0.220000	0.003900
71	0.500000	0.000000	0.180000	0.003900
72	0.500000	0.000000	0.110000	0.003900
73	0.500000	0.000000	0.020000	0.003900
74	0.500000	0.000000	0.020000	0.003900
75	0.500000	0.000000	1.000000	0.003900

PRIOR YEAR ASSUMPTIONS

VALUATION INTEREST RATE: 7.00% (Net of investment expense)

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.