

**PAROCHIAL EMPLOYEES'
RETIREMENT SYSTEM**

ACTUARIAL VALUATION AS OF
DECEMBER 31, 2018

G. S. CURRAN & COMPANY, LTD.

Actuarial Services

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June 13, 2019

Board of Trustees
Parochial Employees' Retirement System
P.O. Box 14619
Baton Rouge, LA 70898-4619

Ladies and Gentlemen:

We are pleased to present our report on the actuarial valuation of the Parochial Employees' Retirement System for the fiscal year ending December 31, 2018. 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 the Parochial Employees' Retirement System. The primary purposes of the report are to determine the actuarially required contribution for the retirement system for the fiscal year ending December 31, 2019, to recommend the net direct employer contribution rate for Fiscal 2020. 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 the Parochial Employees' Retirement System for a specific limited purpose. It is not for the use or benefit of any third party for any purpose.

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

Sincerely,

G. S. CURRAN & COMPANY, LTD.

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

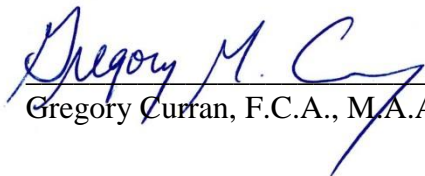

Gregory Curran, F.C.A., M.A.A.A., A.S.A.

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**SUMMARY OF VALUATION RESULTS
PAROCHIAL EMPLOYEES' RETIREMENT SYSTEM – PLAN A**

| Valuation Date: | December 31, 2018 | December 31, 2017 |
|---|-------------------|-------------------|
| Census Summary: | | |
| Active Members | 14,027 | 14,201 |
| Retired Members and Survivors | 7,467 | 7,301 |
| Terminated Due a Deferred Benefit | 813 | 709 |
| Terminated Due a Refund | 7,845 | 7,482 |
| Payroll: | \$ 615,887,352 | \$ 605,199,478 |
| Benefits in Payment: | \$ 177,804,484 | \$ 170,697,910 |
| Present Value of Future Benefits: | \$ 4,897,404,869 | \$ 4,632,531,531 |
| Actuarial Accrued Liability (EAN): | \$ 3,908,729,734 | \$ 3,676,214,901 |
| Funding Deposit Account Credit Balance: | \$ 78,847,141 | \$ 66,910,393 |
| Actuarial Asset Value (AVA): | \$ 3,753,426,178 | \$ 3,657,539,805 |
| Market Value of Assets (MVA): | \$ 3,540,960,468 | \$ 3,829,020,281 |
| Ratio of AVA to Actuarial Accrued Liability (EAN): | 96.03% | 99.49% |
| | Fiscal 2018 | Fiscal 2017 |
| Market Rate of Return: | -5.6% | 17.3% |
| Actuarial Rate of Return: | 4.7% | 8.6% |
| | Fiscal 2019 | Fiscal 2018 |
| Employers' Normal Cost (Mid-year): | \$ 82,528,403 | \$ 67,799,112 |
| Estimated Administrative Cost: | \$ 1,686,390 | \$ 1,537,336 |
| Projected Ad Valorem Tax Contributions: | \$ 7,653,690 | \$ 7,420,668 |
| Projected Revenue Sharing Funds: | \$ 135,454 | \$ 136,120 |
| Net Direct Employer Actuarially Required Contributions: | \$ 76,425,649 | \$ 61,779,660 |
| Projected Payroll: | \$ 627,414,629 | \$ 618,406,554 |
| Actual Employee Contribution Rate: | 9.50% | 9.50% |
| Actual Net Direct Employer Contribution Rate: | 11.50% | 11.50% |
| Actuarially Required Net Direct Employer Contribution Rate: | 12.18% | 9.99% |
| | Fiscal 2020 | Fiscal 2019 |
| Minimum Recommended Net Direct Employer Cont. Rate: | 12.25% | 10.00% |

**SUMMARY OF VALUATION RESULTS
PAROCHIAL EMPLOYEES' RETIREMENT SYSTEM – PLAN B**

| Valuation Date: | December 31, 2018 | December 31, 2017 |
|---|-------------------|-------------------|
| Census Summary: | | |
| Active Members | 2,429 | 2,459 |
| Retired Members and Survivors | 896 | 855 |
| Terminated Due a Deferred Benefit | 154 | 142 |
| Terminated Due a Refund | 1,708 | 1,637 |
| Payroll: | \$ 105,914,905 | \$ 103,056,369 |
| Benefits in Payment: | \$ 11,243,992 | \$ 10,430,300 |
| Present Value of Future Benefits: | \$ 429,603,067 | \$ 407,015,556 |
| Actuarial Accrued Liability (EAN): | \$ 329,243,218 | \$ 307,480,656 |
| Funding Deposit Account Credit Balance: | \$ 6,220,583 | \$ 5,361,971 |
| Actuarial Asset Value (AVA): | \$ 326,300,632 | \$ 310,818,392 |
| Market Value of Assets (MVA): | \$ 307,800,757 | \$ 325,626,878 |
| Ratio of AVA to Actuarial Accrued Liability (EAN): | 99.11% | 101.09% |
| | Fiscal 2018 | Fiscal 2017 |
| Market Rate of Return: | -5.7% | 17.4% |
| Actuarial Rate of Return: | 4.8% | 8.5% |
| | Fiscal 2019 | Fiscal 2018 |
| Employers' Normal Cost (Mid-year): | \$ 9,174,881 | \$ 8,432,337 |
| Estimated Administrative Cost: | \$ 290,011 | \$ 261,785 |
| Projected Ad Valorem Tax Contributions: | \$ 1,316,214 | \$ 1,263,628 |
| Projected Revenue Sharing Funds: | \$ 23,294 | \$ 23,179 |
| Net Direct Employer Actuarially Required Contributions: | \$ 8,125,384 | \$ 7,407,315 |
| Projected Payroll: | \$ 107,903,460 | \$ 105,640,944 |
| Actual Employee Contribution Rate: | 3.00% | 3.00% |
| Actual Net Direct Employer Contribution Rate: | 7.50% | 7.50% |
| Actuarially Required Net Direct Employer Contribution Rate: | 7.53% | 7.01% |
| | Fiscal 2020 | Fiscal 2019 |
| Minimum Recommended Net Direct Employer Cont. Rate: | 7.50% | 7.00% |

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 ascribe a greater degree of certainty and accuracy to the results than warranted. In fact, neither of these descriptions 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 data used; 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 in such areas as expectation of population increase and turnover for the plan 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 process 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. Fortunately, 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 level of funding and to provide for the future benefits of plan participants.

COMMENTS ON DATA

For the valuation, the administrative director of the system furnished a census derived from the system's master data processing file indicating each active covered employee's sex, date of birth, service credit, annual salary, and accumulated contributions. Information on retirees detailing dates of birth of retirees and beneficiaries, as well as option categories and benefit amounts, was provided in like manner. In addition, data was supplied on former employees who are vested or who have contributions remaining on deposit. As illustrated in Exhibit IX, there are 14,027 active members in Plan A, of whom, 7,246 members, including 551 participants in the Deferred Retirement Option Plan (DROP), have vested retirement benefits; 7,467 former members of Plan A or their beneficiaries are receiving retirement benefits. An additional 8,658 former members of Plan A have contributions remaining on deposit with the system. This includes 813 former members who have vested rights or have filed reciprocal agreements for future retirement benefits. Census data on members of Plan B may be found in Exhibit XIX. There are 2,429 active members in Plan B, of whom, 1,202 members, including 91 DROP participants, have vested retirement benefits; 896 former members of Plan B or their beneficiaries are receiving retirement benefits. An additional 1,862 former members of Plan B have contributions remaining on deposit with the system. Of this number, 154 have vested rights or have filed reciprocal agreements 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 administrator 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 administrative director 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 system's auditor, the firm of Duplantier, Hrapmann, Hogan & Maher, L.L.P. As indicated in the system's audit report, the net market value of Plan A's assets was \$3,540,960,468 as of December 31, 2018. For Plan A, the net investment income for Fiscal 2018 measured on a market value basis amounted to a loss of \$213,305,699. Contributions to Plan A for the fiscal year totaled \$133,234,944; benefits and expenses amounted to \$207,989,058.

The net market value of Plan B's assets was \$307,800,757 as of December 31, 2018. For Plan B, the net investment income for Fiscal 2018 measured on a market value basis amounted to a loss of \$18,484,521. Contributions to Plan B for the fiscal year totaled \$13,774,225; benefits and expenses amounted to \$13,115,825.

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

Plan A was previously funded under the Frozen Attained Age Normal Cost Method. The Frozen Unfunded Accrued Liability was fully amortized in Fiscal 2012. Hence, for the Fiscal 2013 valuation, the system's funding method was changed to the Aggregate Actuarial Cost Method. Plan B is funded utilizing the Aggregate Actuarial Cost Method. This method does not develop an unfunded actuarial liability. Under the Aggregate Cost Method, actuarial gains and losses are spread over future normal costs. Thus, favorable plan experience will lower future normal costs; unfavorable experience will cause future normal costs to increase. In both plans, benefit and assumption changes are also spread over future normal costs. Effective with Fiscal 2008, for both Plans A and B, any excess funds collected pursuant to R. S. 11:105 or R. S. 11:107 are allocated to the Funding Deposit Account. The Funding Deposit Account credit balance as of the end of the prior fiscal year for Plans A and B was \$66,910,393 and \$5,361,971, respectively. Both accounts were increased with interest at 6.75% for the year. A freeze in the employer contribution rate in Plan A for Fiscal 2018 resulted in a contribution gain of \$7,420,296 as of December 31, 2018. A freeze in the employer contribution rate in Plan B for Fiscal 2018 resulted in a contribution gain of \$496,679 as of December 31, 2018. No funds were withdrawn from the Funding Deposit Account during Fiscal 2018 for either plan. When interest and additional contributions were added to the Funding Deposit Accounts, the resulting balances as of December 31, 2018 for Plans A and B were \$78,847,141 and \$6,220,583, respectively.

The current year actuarial assumptions utilized for this report are based on the results of an actuarial experience study for the period January 1, 2013 – December 31, 2017, 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. In determining the valuation interest rate, consideration was given to several factors. First, consensus estimates of rates of return, standard deviations, and correlation coefficients for asset classes derived from various asset consulting firms were developed. Secondly, projected long-term inflation estimates from a number of sources were reviewed. These factors were used to derive forward estimates of the Fund's portfolio earnings rate. Consideration was also given to a 2018 report of Segal Marco Advisors on 20 year Return Projections of future expected rates of return for the current portfolio asset. A review of the above information finds that it would be reasonable to maintain the current valuation interest rate of 6.75%. However, given the Board's recent desire for conservatism in the Plan and the desire to reduce the long-term risk of the retirement fund, the assumed rate of return for the valuation was reduced from 6.75% to 6.50% for Plans A and B. This reduction places the plan valuation interest rate closer to the estimated long term portfolio geometric rates of return developed based on information provided by Segal Marco as well as other consultants surveyed. We have also lowered the inflation rate assumption from 2.50% to

2.40% implicit in both the assumed rate of return and rate of salary increases. Additional information on all aspects of the assumptions is included in the 2018 Experience Report.

Although the board of trustees has authority to grant ad hoc Cost of Living Adjustments (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. In addition, COLAs paid out of the Funding Deposit Account do not affect the actuarially required contributions to the system. Therefore, for purposes of determining the present value of benefits, these COLAs were deemed not to be substantively automatic and the present value of benefits excludes COLAs not previously granted by the board of trustees.

The current year actuarial assumptions utilized for the report are outlined on pages sixty-six through seventy-one. All assumptions used are based on estimates of future long-term experience for the fund. All calculations, recommendations, and conclusions are based on the assumptions specified. To the extent that prospective experience differs from that assumed adjustments will be required to contribution levels. Such differences will be revealed in future actuarial valuations. For this valuation, the effect of changes in assumptions was an increase in the required contribution rate for Plan A of 1.1369% and an increase in the required contribution rate for Plan B of 0.1820%.

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 cost of living adjustments, 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. For the last decade, inflation levels have remained in a fairly narrow range. Current forecasts from investment professionals call for a continuation of this trend. 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 assess both of 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 steeply 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 demonstration given in this report illustrates the noninvestment cash flow and benefit payments of the system over the last 10 years. Currently, annual benefit payments exceed annual contributions to the plan for Plan A and are slightly less than annual contributions to the plan for Plan B. This is a result of the plan's maturity level and the reduction in required contributions after the elimination of the plan's frozen unfunded actuarial liability. 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 proportion of retired membership will continue and the current trend toward higher level of negative noninvestment cash flows will continue for Plan A, and it is likely that benefit payments will exceed contributions to Plan B in the near future.

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 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 dependent upon the severity of the event, and cannot be easily forecasted.

Beyond identifying risk categories, it is possible to quantify some risk factors. One fairly well known risk metric is the funded ratio of the plan. The rate is given as plan assets divided by plan liabilities.

However, the definition of each of these terms may vary. The two typical alternatives used for assets are the market and actuarial value of assets. There are a number of alternative measures of liability depending on the funding method employed. The Governmental Accounting Standards Board (GASB) specifies that for financial reporting purposes, the funded ratio is determined by using the market value of assets divided by the entry age normal accrued liability. This value is given in the system's financial report. Alternatively, we have calculated the ratio of the actuarial value of assets to the entry age normal accrued liability based on the funding methodology used to fund the plan. The ratio is 96.03% for Plan A and 99.11% for Plan B as of December 31, 2018. 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. Exhibits X and XX give 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. For Plan A, we have determined that based on current assets and demographics, for each percentage under (over) the assumed rate of return on the actuarial value of assets, there will be a corresponding increase (reduction) in the actuarially required contribution as a percentage of projected payroll of 0.69% for the fund. Similarly for Plan B, we have determined that the corresponding increase (reduction) in the actuarially required contribution as a percentage of projected payroll will be 0.35% 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 11.49 for Plan A and 12.08 for Plan B.

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 2018, this ratio is 28.87% for Plan A and 10.62% for Plan B; ten years ago this ratio was 16.51% for Plan A and 6.34% for Plan B.

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 are that in this area a decrease in the assumptions 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 2019 by 11.47% of payroll for Plan A and 6.58% of payroll for Plan B. 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 effect 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 in plan provisions were enacted during the 2018 Regular Session of the Louisiana Legislature:

Act 45 of the 2018 Regular Session of the Louisiana Legislature provides that state and statewide retirement systems may invest in terror free investments outside of index fund vehicles to meet the requirements of R.S. 11:316.

Act 225 of the 2018 Regular Session of the Louisiana Legislature added language to comply with certain federal laws related to the Uniformed Services Employment and Reemployment Rights Act (USERRA) providing that each Board of Trustees shall promulgate rules to comply with USERRA.

Act 397 of the 2018 Regular Session of the Louisiana Legislature stipulates that state and statewide retirement systems may appoint an actuary or actuaries whose duties assigned by the Board shall relate only to the practice of actuarial science or ministerial duties that do not require the exercise of supervision or discretionary control over the administration or management of the system.

Act 399 of the 2018 Regular Session of the Louisiana Legislature stipulates that the Public Retirement Systems' Actuarial Committee is established as the public retirement and pension system advisor of the Legislature of Louisiana. The act further states that the chair and vice chair shall rotate biennially between the speaker of the House of Representatives, or his designee, and the president of the Senate, or his designee, with terms beginning on the first of July. The committee shall elect any other officers as deemed advisable but no officer shall serve for more than four consecutive years.

ASSET EXPERIENCE

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

| <u>Plan A</u> | <u>Market Value</u> | <u>Actuarial Value</u> |
|---------------|---------------------|------------------------|
| 2009 | 20.6% | 9.1% |
| 2010 | 15.2% | 4.4% |
| 2011 | -0.7% | 2.9% |
| 2012 | 15.6% | 4.2% |
| 2013 | 18.1% | 13.0% |
| 2014 | 4.9% | 10.5% |
| 2015 | -0.6% | 7.3% |
| 2016 | 7.7% | 7.8% |
| 2017 | 17.3% | 8.6% |
| 2018 | -5.6% | 4.7% |

| <u>Plan B</u> | <u>Market Value</u> | <u>Actuarial Value</u> |
|---------------|---------------------|------------------------|
| 2009 | 20.7% | 8.8% |
| 2010 | 15.4% | 4.6% |
| 2011 | -0.7% | 3.2% |
| 2012 | 15.8% | 4.8% |
| 2013 | 17.6% | 12.8% |
| 2014 | 4.9% | 10.3% |
| 2015 | -0.7% | 7.1% |
| 2016 | 7.7% | 7.5% |
| 2017 | 17.4% | 8.5% |
| 2018 | -5.7% | 4.8% |

Geometric Average Market Rates of Return – Plan A

| | | |
|-----------------|----------------------|------|
| 5 year average | (Fiscal 2014 – 2018) | 4.5% |
| 10 year average | (Fiscal 2009 – 2018) | 8.9% |
| 15 year average | (Fiscal 2004 – 2018) | 6.2% |
| 20 year average | (Fiscal 1999 – 2018) | 5.8% |
| 25 year average | (Fiscal 1994 – 2018) | 7.0% |

Geometric Average Market Rates of Return – Plan B

| | | |
|-----------------|----------------------|------|
| 5 year average | (Fiscal 2014 – 2018) | 4.4% |
| 10 year average | (Fiscal 2009 – 2018) | 8.9% |
| 15 year average | (Fiscal 2004 – 2018) | 6.1% |
| 20 year average | (Fiscal 1999 – 2018) | 5.9% |
| 25 year average | (Fiscal 1994 – 2018) | 6.7% |

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. 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 2018, Plan A earned \$63,559,473 and Plan B earned \$5,439,759 of dividends, interest and other recurring income. In addition, Plan A had net realized and unrealized capital losses and other non-recurring income on investments of \$255,711,136 while the total of such losses for Plan B amounted to \$22,076,009. Investment expenses were \$21,154,036 for Plan A and \$1,848,271 for Plan B.

The actuarial rate of return is presented for comparison to the assumed long-term rate of return of 6.75% for Fiscal 2018. This rate is calculated based on the smoothed value of assets subject to constraints as given in Exhibit III-B for Plan A and Exhibit XIII-B for Plan B. Investment income used to calculate this yield is based upon a smoothing of investment income above or below the valuation interest rate. The difference between rates of return on an actuarial and market value basis results from the smoothing utilized. Yields in excess of the 6.50% assumption will reduce future costs; yields below 6.50% will increase future costs. Net actuarial investment earnings were less than the actuarial assumed earnings rate of 6.75%, used for Fiscal 2018, by \$73,761,694 for Plan A and were less than the actuarial assumed earnings rate of 6.75%, used for Fiscal 2018, by \$6,178,260 for Plan B. These earnings shortfalls for Plan A produced actuarial losses, which increased the normal cost accrual rate by 1.3512% and the earnings shortfalls for Plan B produced actuarial losses, which increased the normal cost accrual rate by 0.6647% for Plan B.

At the end of each fiscal year, a review of the data is made to identify current members of Plan A and Plan B who have consecutive service credit in both plans that have not been addressed in previous transfers of assets and liabilities between the Plan A and Plan B trust funds pursuant to the provisions of R.S. 11: 2012. In the course of reviewing data for the December 31, 2018 valuation we found members of Plan A and Plan B with such service and recommend a transfer of \$1,062,257 be made from the Plan A trust to the Plan B trust for Fiscal 2018.

PLAN A – DEMOGRAPHICS AND LIABILITY EXPERIENCE

A reconciliation of the census for the plan is given in Exhibit IX. The average active member (including DROP participants) is 47 years old with 9.98 years of service and an annual salary of \$43,907. The plan's active membership, inclusive of DROP participants, decreased by 174 members during the fiscal year. The plan has experienced an increase in the active plan population of 161 members over the last five years. A review of the active census by age indicates that over the last ten years the population in the forty-one to fifty age group has declined while the population in the sixty-

one to seventy age group has increased. Over the same ten-year period the plan showed a fairly stable distribution among the various service groups.

The average regular retiree is 71 years old with a monthly benefit of \$2,152. The number of retirees and beneficiaries receiving benefits from the system increased by 166 during the fiscal year; over the last five years the number of retirees has increased by 1,225 and benefit payments have increased by \$53,504,699.

Plan liability experience for Fiscal 2018 was favorable. Retirements, disabilities and salary increases were below projected levels. Withdrawals and retiree deaths were above projected levels. These factors tend to reduce costs. Partially offsetting these factors were DROP entries above projected levels. In aggregate, plan liability gains decreased the normal cost accrual rate by 0.1190%.

PLAN B – DEMOGRAPHICS AND LIABILITY EXPERIENCE

A reconciliation of the census for the plan is given in Exhibit XIX. The average active member (including DROP participants) is 47 years old with 9.64 years of service and an annual salary of \$43,604. The plan's active membership, inclusive of DROP participants, decreased by 30 members during the fiscal year. The plan has experienced an increase in the active plan population of 141 members over the last five years. A review of the active census by age indicates that over the last ten years the population in the forty-one to fifty age group has declined while the population in the sixty-one to seventy age group has increased. Over the same ten-year period the plan showed a fairly stable distribution among the various service groups.

The average regular retiree is 72 years old with a monthly benefit of \$1,120. The number of retirees and beneficiaries receiving benefits from the system increased by 41 during the fiscal year; over the last five years the number of retirees has increased by 208 and benefit payments have increased by \$4,464,878.

Plan liability experience for Fiscal 2018 was favorable. Salary increases were below projected levels. Withdrawals were above projected levels. These factors tend to reduce costs. Partially offsetting these factors were retirements and DROP entries which were above projected levels. In aggregate, plan liability gains decreased the normal cost accrual rate by 0.3142%.

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 the normal cost, and the actuarially required contributions are based on the sum of this value and administrative expenses. Under the funding method used for the plan, changes in plan experience, benefits, or assumptions increase or decrease future normal costs. In addition excess or deficient contributions can decrease or increase future costs. The funding method used for both plans produces no unfunded actuarial accrued liability.

In order to establish the actuarially required contribution in any given year, it is necessary to define the assumptions and funding method. Thus, the determination of what contribution is actuarially required depends upon the funding method 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.

Under the provisions of R.S. 11:103, excess or deficient contributions typically decrease or increase future normal costs. However, if the minimum net direct employer contribution is scheduled to decrease, the board may maintain the contribution rate at some level above the minimum recommended rate. Pursuant to R. S. 11:105 and R. S. 11:107, such excess contributions are credited to the Funding Deposit Account.

For Plan A, the derivation of the actuarially required contribution for the current fiscal year is given in Exhibit I. The normal cost for Fiscal 2019 as of January 1, 2019 is \$79,970,284. The total actuarially required contribution is determined by adjusting the value for interest (since payments are made throughout the fiscal year) and adding estimated administrative expenses. As given on line 12 of Exhibit I the total actuarially required contribution for Fiscal 2019 is \$84,214,793. When this amount is reduced by projected tax contributions and revenue sharing funds, the resulting employers' net direct actuarially required contribution for Fiscal 2019 is \$76,425,649. This is 12.18% of the projected Plan A payroll for Fiscal 2019.

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 would increase required 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 cost structure for Plan A are outlined below:

| | |
|---|----------|
| Employer's Normal Cost Accrual Rate – Fiscal 2018 | 11.6844% |
| Factors Increasing the Normal Cost Accrual Rate: | |
| Assumption Changes | 1.1369% |
| Asset Experience Loss | 1.3512% |
| Factors Decreasing the Normal Cost Accrual Rate: | |
| Plan Liability Experience Gain | 0.1190% |
| New Members | 0.2032% |
| Employer's Normal Cost Accrual Rate – Fiscal 2019 | 13.8503% |

Required net direct employer contributions are also affected by the available ad valorem taxes and revenue sharing funds which the system receives each year. When these funds change as a percentage of payroll, net direct employer contributions are adjusted accordingly. We estimate that for Plan A these funds collected in Fiscal 2019 will increase by 0.02% of payroll. The net effect of the above changes in the cost structure of the system resulted in a minimum actuarially required net direct employer contribution rate for Fiscal 2019 for Plan A of 12.18%; the actual employer contribution rate

for Fiscal 2019 is 11.50% of payroll. R.S. 11:103 requires that the net direct employer contributions be rounded to the nearest 0.25%, hence we are recommending a minimum net direct employer contribution rate for Plan A of 12.25% for Fiscal 2020.

For Plan B, the derivation of the actuarially required contribution for the current fiscal year is given in Exhibit XI. The normal cost for Fiscal 2019 as of January 1, 2019 is \$8,890,489. The total actuarially required contribution is determined by adjusting the value for interest (since payments are made throughout the fiscal year) and adding estimated administrative expenses. As given on line 12 of Exhibit XI the total actuarially required contribution for Fiscal 2019 is \$9,464,892. When this amount is reduced by projected tax contributions and revenue sharing funds, the resulting employers' net direct actuarially required contribution for Fiscal 2019 is \$8,125,384. This is 7.53% of the projected Plan B payroll for Fiscal 2019.

The effects of various factors on the cost structure for Plan B are outlined below:

| | |
|---|---------|
| Employer's Normal Cost Accrual Rate – Fiscal 2018 | 8.5248% |
| Factors Increasing the Normal Cost Accrual Rate: | |
| Assumption Changes | 0.1820% |
| Asset Experience Loss | 0.6647% |
| Factors Decreasing the Normal Cost Accrual Rate: | |
| Plan Liability Experience Gain | 0.3142% |
| New Members | 0.0549% |
| Employer's Normal Cost Accrual Rate – Fiscal 2019 | 9.0025% |

We estimate that for Plan B the funds collected from ad valorem taxes and revenue sharing funds in Fiscal 2019 will increase by 0.02% of payroll. The net effect of the above changes in the cost structure of the system resulted in a minimum actuarially required net direct employer contribution rate for Fiscal 2019 for Plan B of 7.53%; the actual employer contribution rate for Fiscal 2019 is 7.50% of payroll. R.S. 11:103 requires that the net direct employer contributions be rounded to the nearest 0.25%, hence we are recommending a minimum net direct employer contribution rate for Plan B of 7.50% for Fiscal 2020.

COST OF LIVING INCREASES

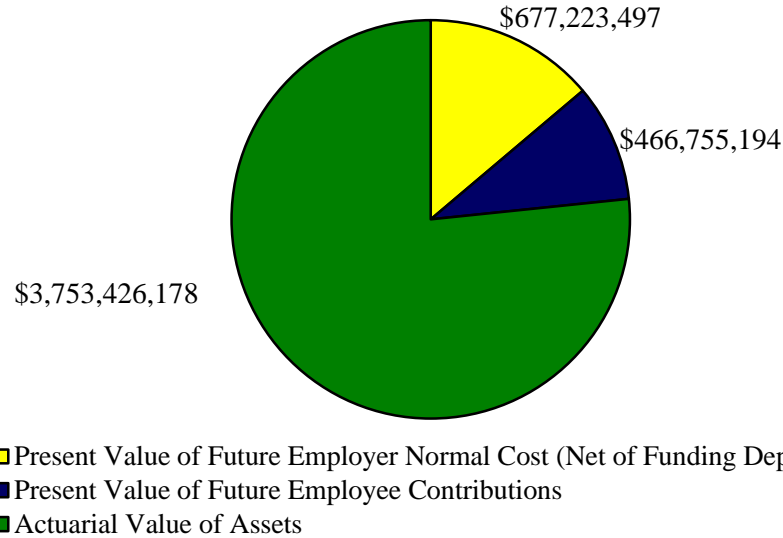
During calendar 2018 the actual cost of living (as measured by the U.S. Department of Labor CPI-U) increased by 1.91%. Cost of living provisions for the system are detailed in R.S. 11:1937 and R.S. 11:246. The former statute allows the board to use interest earnings in excess of the normal requirements to grant annual cost of living increases of 2.50% of the current benefit to retirees aged 62 or over, who have been retired at least one year. 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. R.S. 11:241 provides that cost of living benefits shall be in the form (unless the board otherwise specifies) of $\$X \times (A+B)$ where X is at most \$1 and "A" represents the number of years of credited service accrued at retirement or at death of the member or retiree and "B" is equal to the number of years since

retirement or since death of the member or retiree to December 31st of the initial year of such increase. The provisions of this subpart do not repeal provisions relative to cost of living adjustments contained within the individual laws governing systems; however, they are to be controlling in cases of conflict.

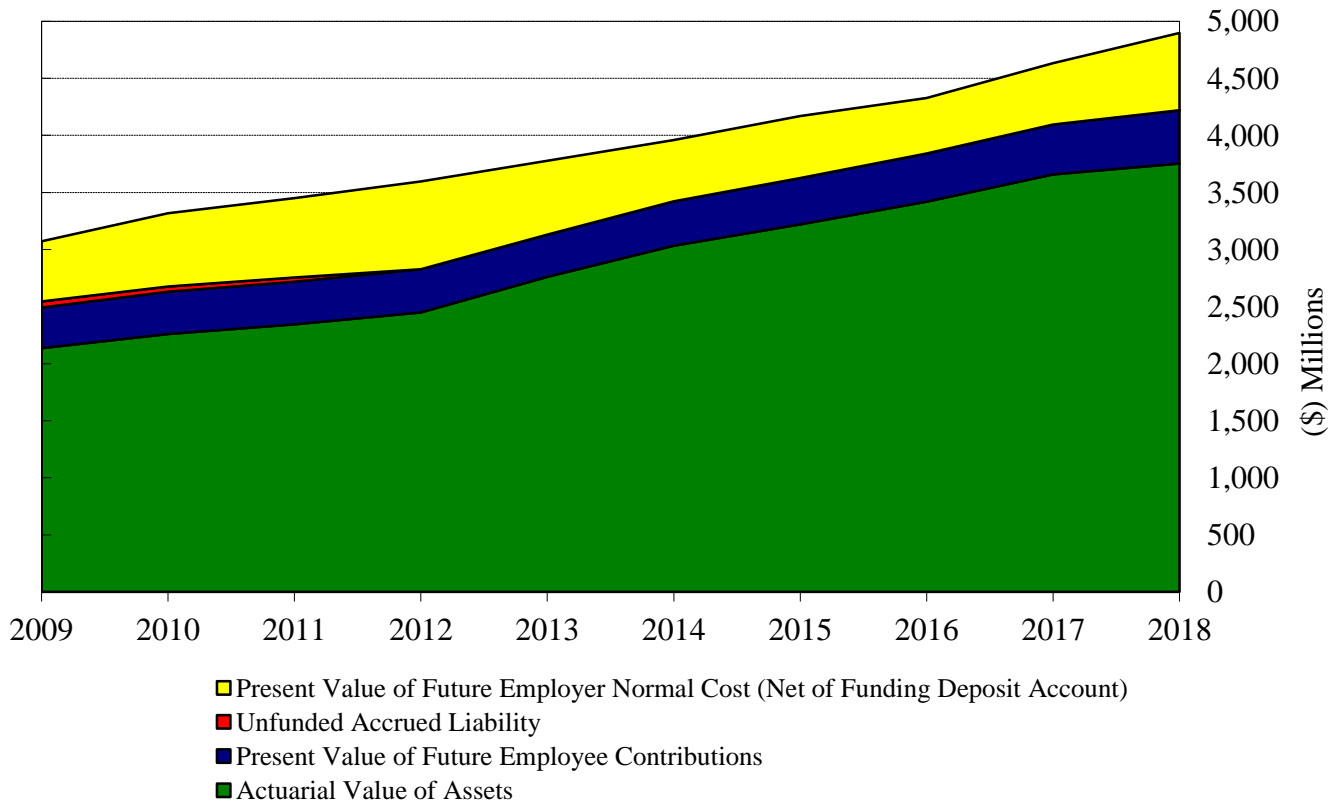
All of the above provisions require that the system earn sufficient excess interest earnings to fund the increases unless the Board funds a cost of living increase out of the Funding Deposit Account Credit Balance. For Fiscal 2018, neither plan earned excess interest. However, RS 11:243 permits payment of a cost of living adjustment from the plan's Funding Deposit Account if the plan has a funded ratio of 90% or more and has not granted a benefit increase to retirees, survivors, and beneficiaries in the most recent fiscal year. If COLAs are paid from the Funding Deposit Account, there will be no increase in the Normal Cost Accrual Rate for the Plans.

| <u>Plan A COLA Descriptions</u> | <u>Annual Increase in Benefits</u> | <u>Present Value of Increase</u> | <u>Change in Normal Cost %</u> |
|--|------------------------------------|----------------------------------|--------------------------------|
| R.S. 11:1937 – 2 1/2% of current benefit to pensioners over age 62 | \$ 3,465,515 | \$ 32,158,258 | 0.59% |
| R.S. 11:246 - 2% of original benefit to pensioners over age 65 | \$ 2,157,035 | \$ 19,216,196 | 0.35% |
| <u>Plan B COLA Descriptions</u> | <u>Annual Increase in Benefits</u> | <u>Present Value of Increase</u> | <u>Change in Normal Cost %</u> |
| R.S. 11:1937 – 2 1/2% of current benefit to pensioners over age 62 | \$ 249,799 | \$ 2,335,718 | 0.25% |
| R.S. 11:246 - 2% of original benefit to pensioners over age 65 | \$ 156,654 | \$ 1,407,807 | 0.15% |

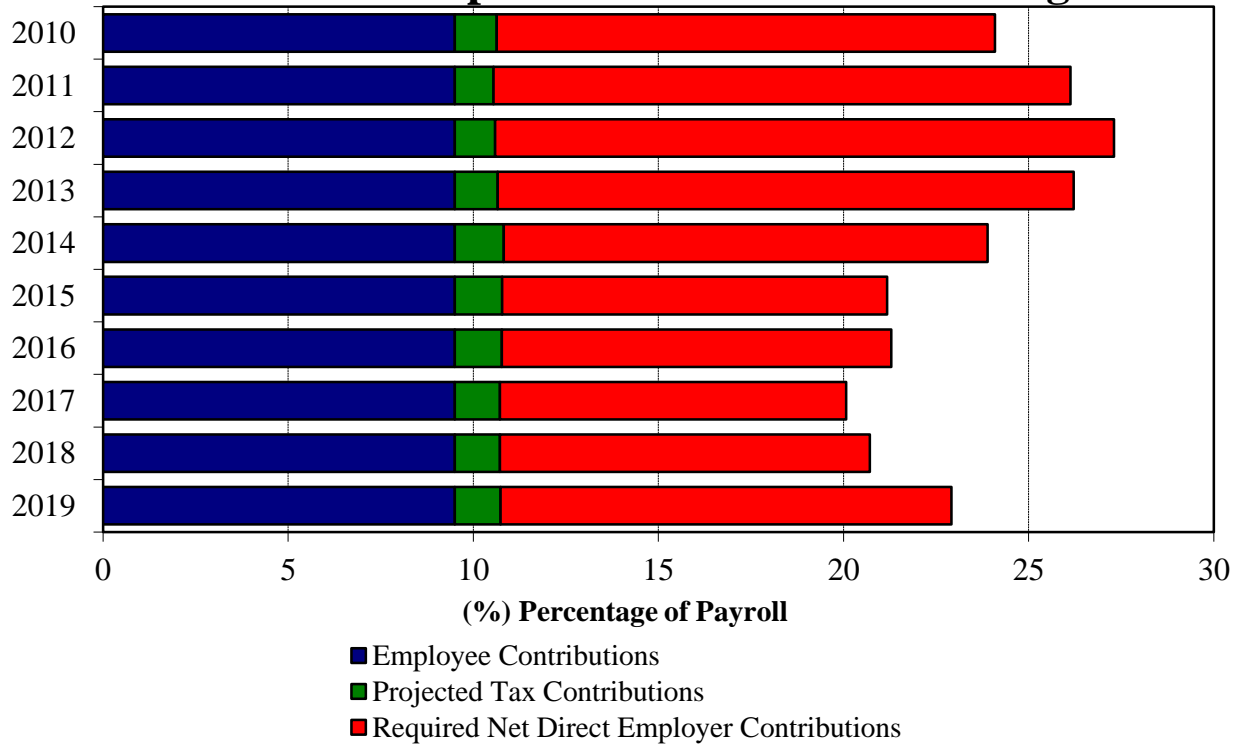
Plan A – Components of Present Value of Future Benefits December 31, 2018



Plan A – Components of Present Value of Future Benefits

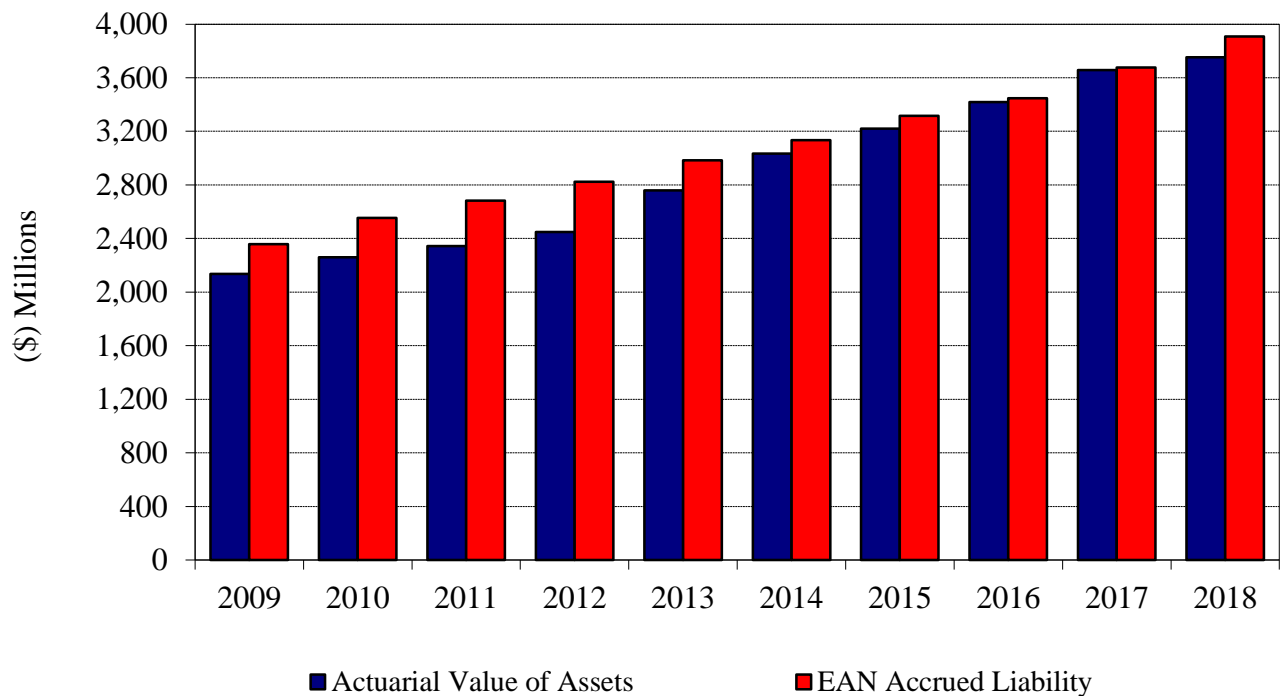


Plan A – Components of Actuarial Funding

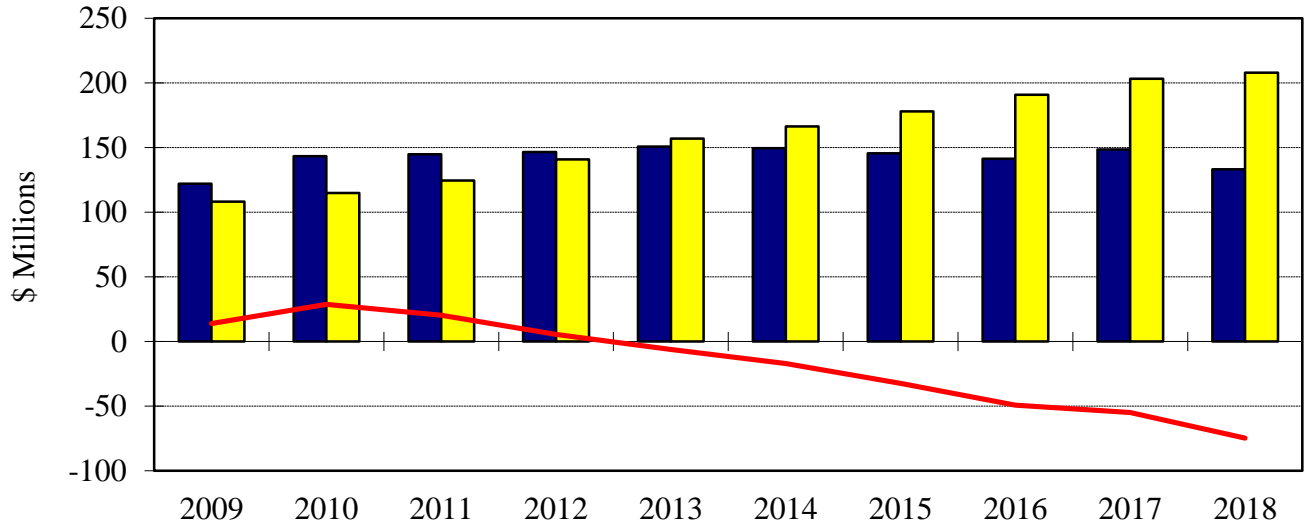


Projected Tax Contributions consist of Projected Ad Valorem and Revenue Sharing Funds as a percent of payroll

Plan A – Actuarial Value of Assets vs. EAN Accrued Liability

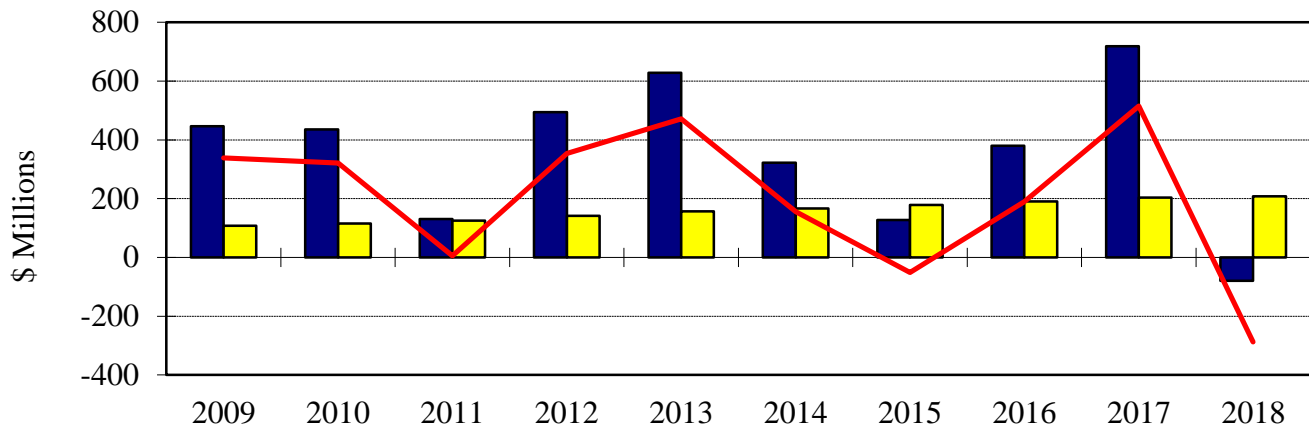


Plan A – Net Non-Investment Income



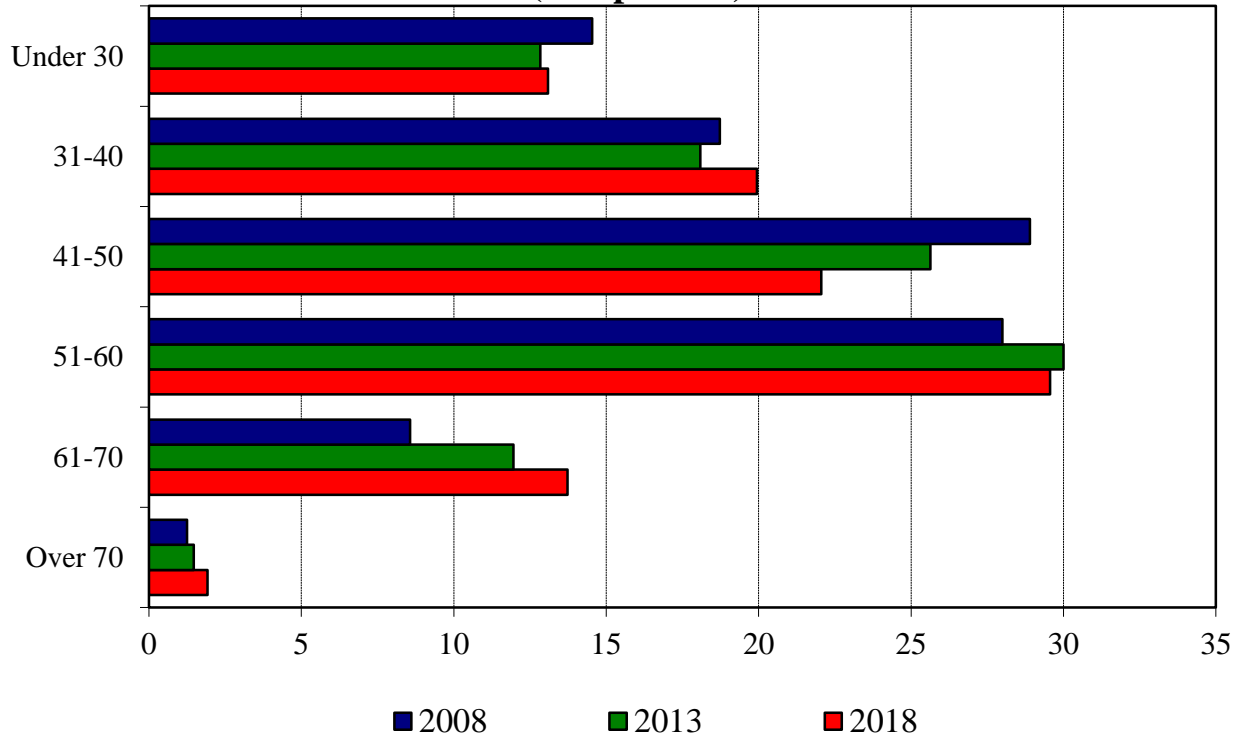
| | | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|-----------------------------------|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Non-Investment Income (\$Mil) | ■ | 121.9 | 143.4 | 144.8 | 146.4 | 149.8 | 149.4 | 145.6 | 141.4 | 148.4 | 133.2 |
| Benefits and Expenses (\$Mil) | ■ | 108.1 | 114.8 | 124.6 | 140.9 | 156.8 | 166.4 | 177.9 | 190.7 | 203.3 | 208.0 |
| Net Non-Investment Income (\$Mil) | — | 13.8 | 28.6 | 20.2 | 5.5 | -7.0 | -17.0 | -32.3 | -49.3 | -54.9 | -74.8 |

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

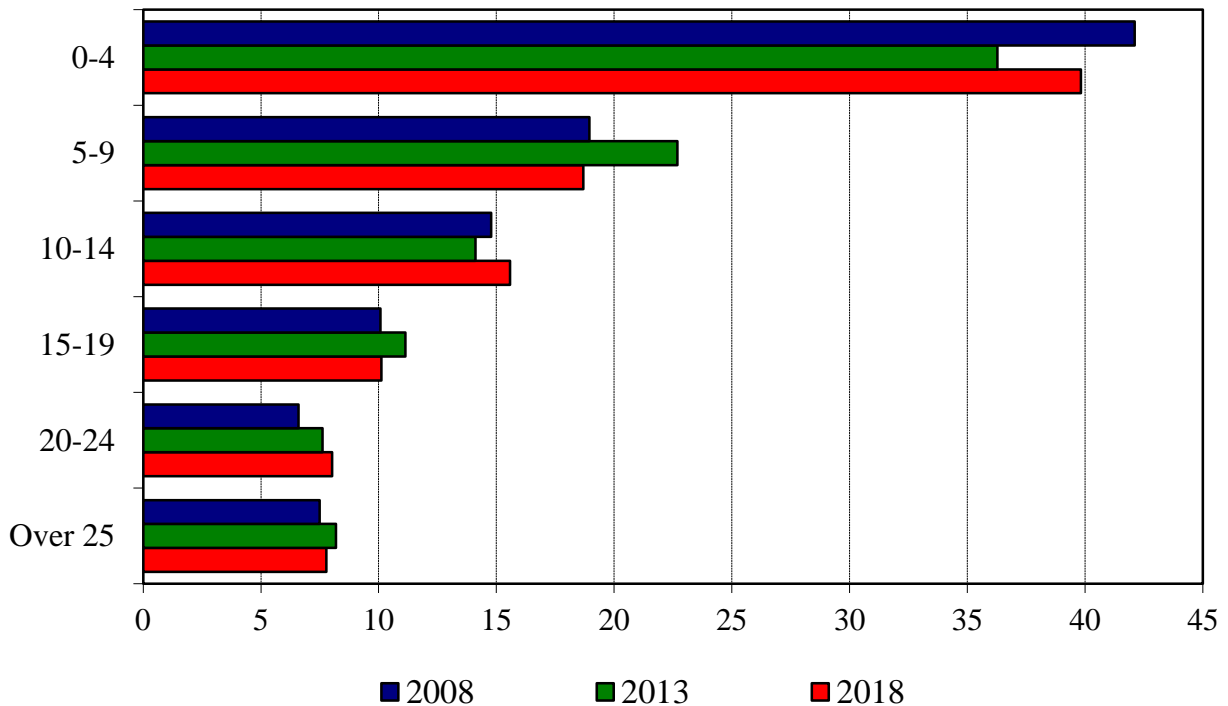


| | | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|-------------------------------|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| Total Income (\$Mil) | ■ | 446.2 | 435.7 | 130.1 | 494.4 | 616.3 | 298.5 | 126.8 | 380.0 | 718.4 | -80.1 |
| Benefits and Expenses (\$Mil) | ■ | 108.1 | 114.8 | 124.6 | 140.9 | 156.8 | 166.4 | 177.9 | 190.7 | 203.3 | 208.0 |
| Net Change in MVA (\$Mil) | — | 338.1 | 320.9 | 5.5 | 353.5 | 459.5 | 132.1 | -51.1 | 189.3 | 515.1 | -288.1 |

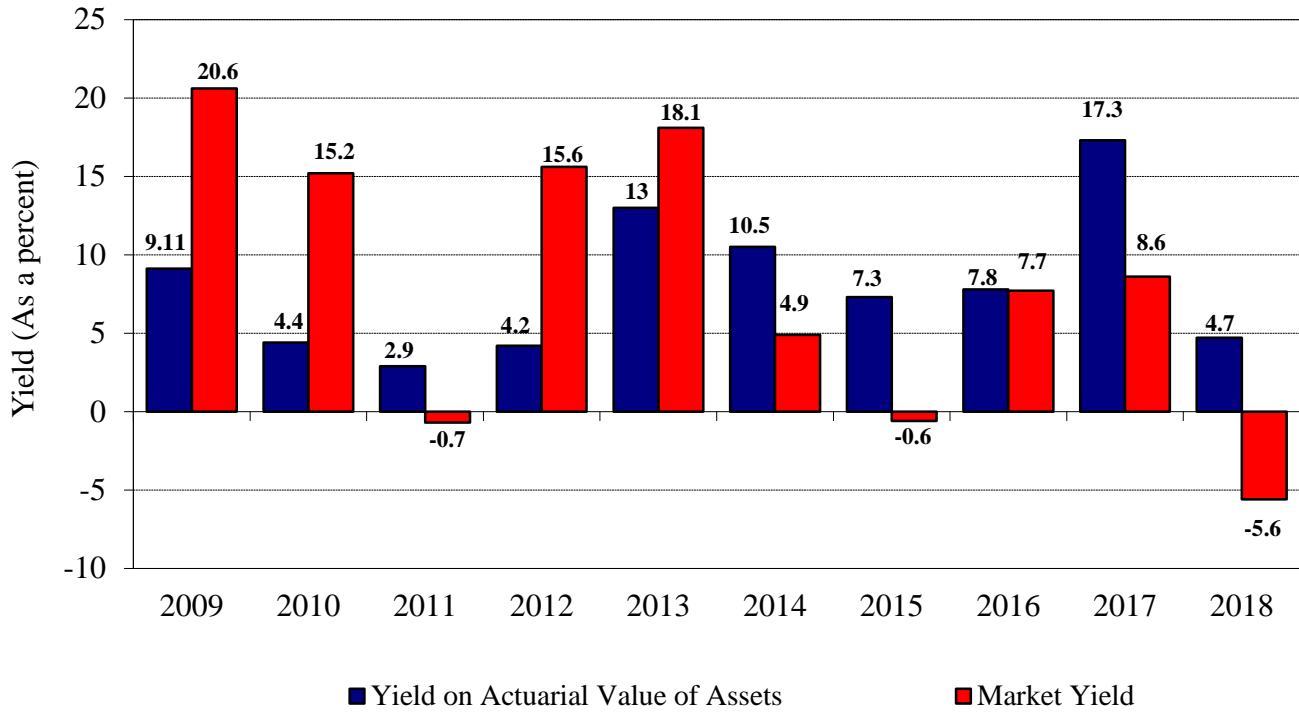
Plan A – Active – Census By Age (as a percent)



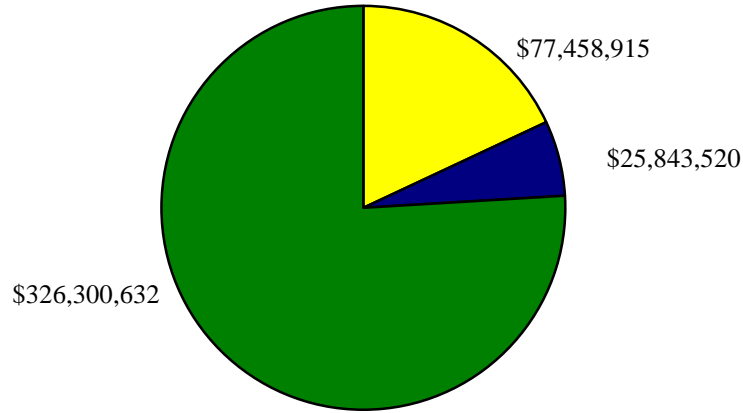
Plan A – Active – Census By Service (as a percent)



Plan A – Historical Asset Yield

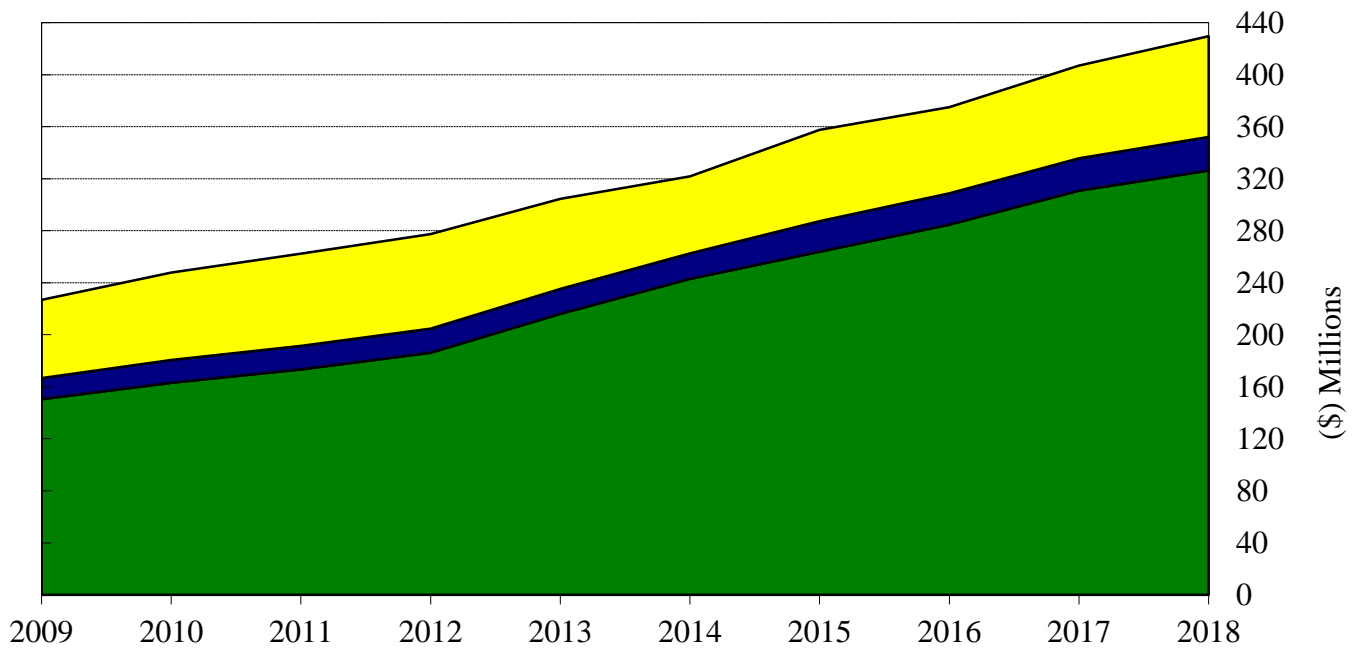


Plan B – Components of Present Value of Future Benefits December 31, 2018



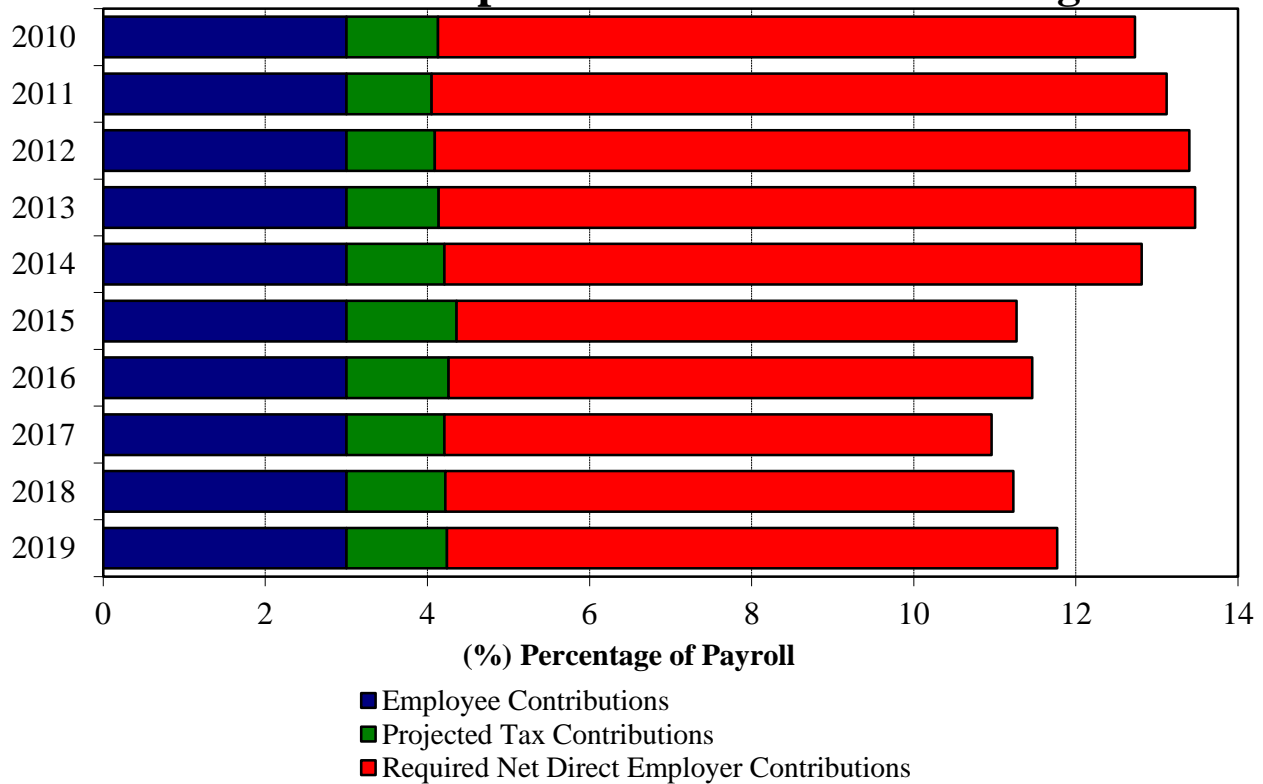
- Present Value of Future Employer Normal Cost (Net of Funding Deposit Account)
- Present Value of Future Employee Contributions
- Actuarial Value of Assets

Plan B – Components of Present Value of Future Benefits



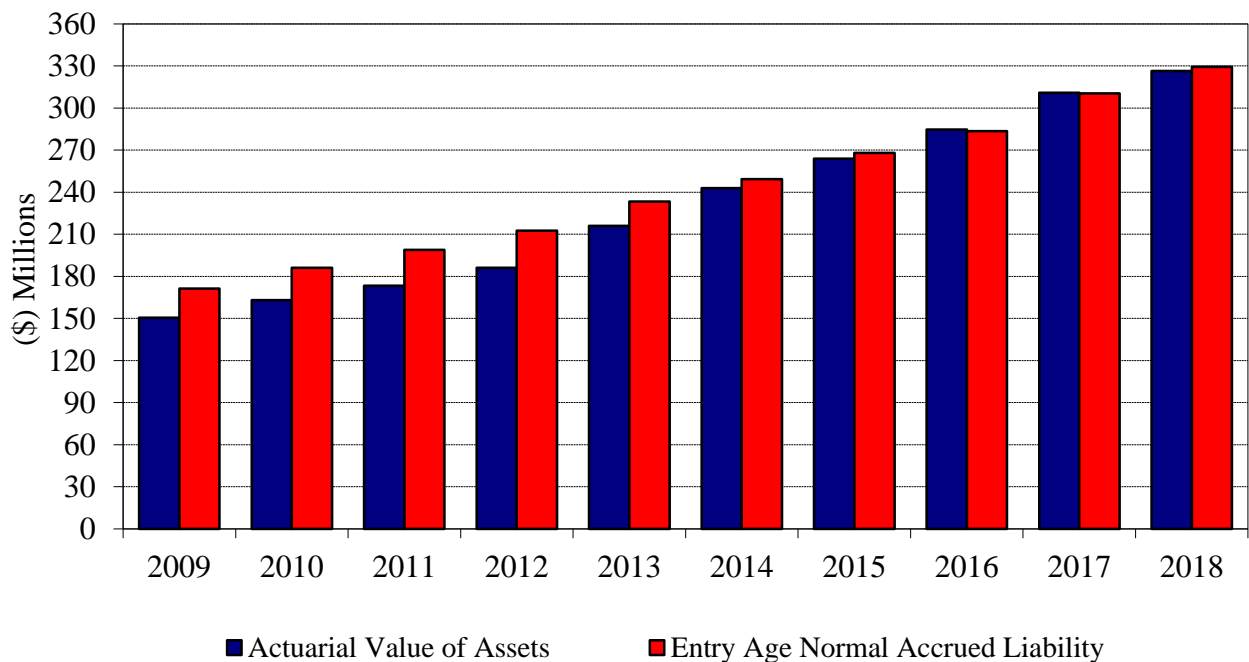
- Present Value of Future Employer Normal Cost (Net of Funding Deposit Account)
- Present Value of Future Employee Contributions
- Actuarial Value of Assets

Plan B – Components of Actuarial Funding

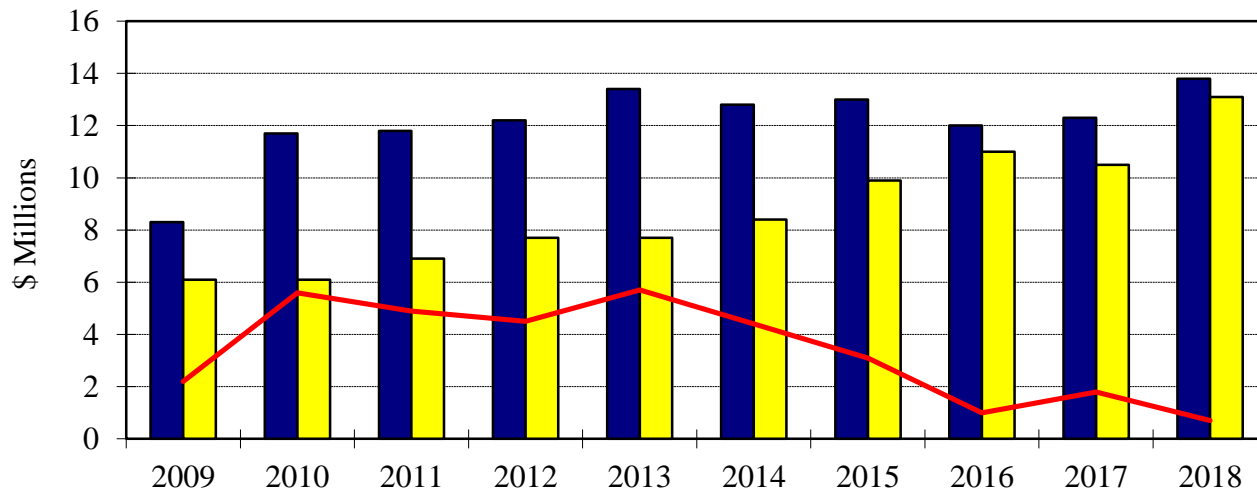


Projected Tax Contributions consist of Projected Ad Valorem and Revenue Sharing Funds as a percent of payroll

Plan B – Actuarial Value of Assets vs. EAN Accrued Liability

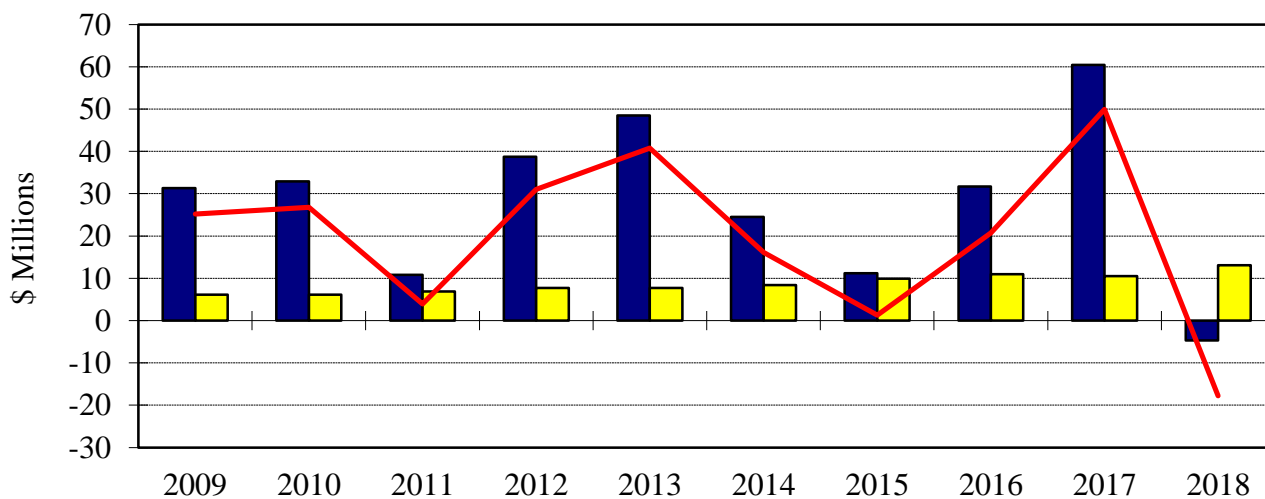


Plan B – Net Non-Investment Income



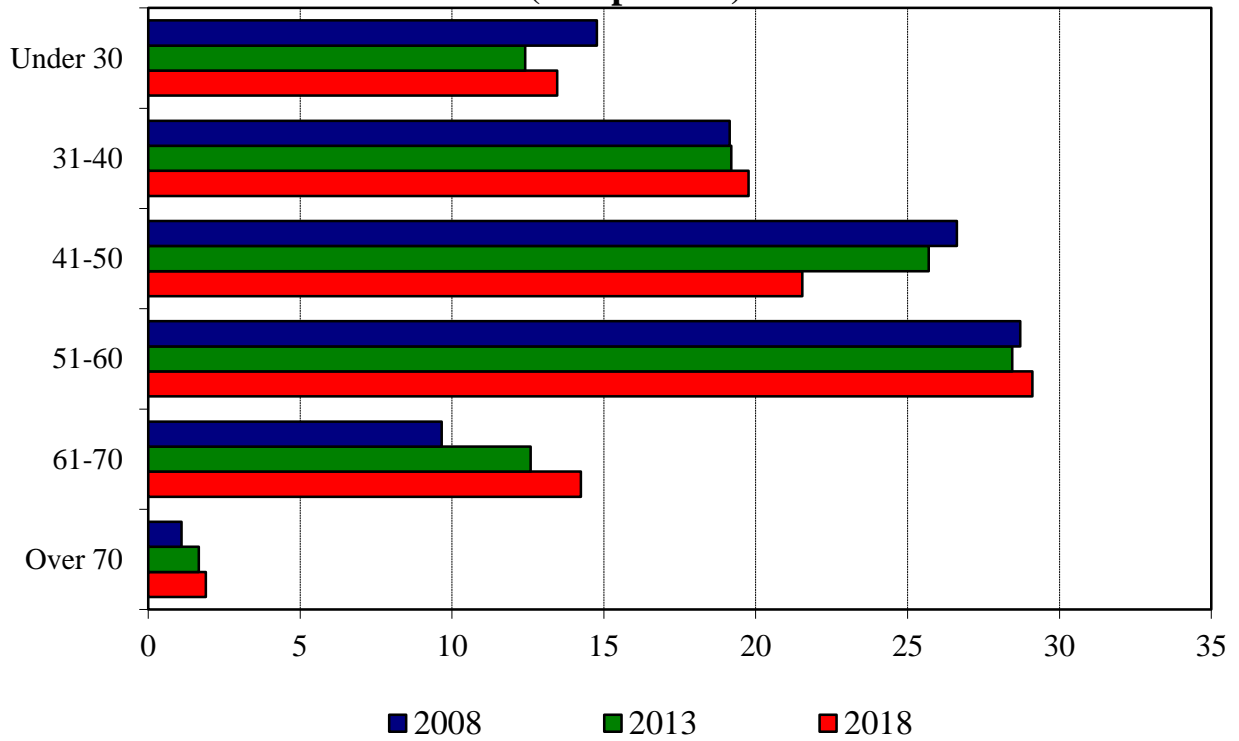
| | | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|-----------------------------------|---------------------------------------|------|------|------|------|------|------|------|------|------|------|
| Non-Investment Income (\$Mil) | ■ | 8.3 | 11.7 | 11.8 | 12.2 | 13.4 | 12.8 | 13.3 | 12.0 | 12.3 | 13.8 |
| Benefits and Expenses (\$Mil) | ■ | 6.1 | 6.1 | 6.9 | 7.7 | 7.7 | 8.4 | 9.9 | 11.0 | 10.5 | 13.1 |
| Net Non-Investment Income (\$Mil) | — | 2.2 | 5.6 | 4.9 | 4.5 | 5.7 | 4.4 | 3.4 | 1.0 | 1.8 | 0.7 |

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

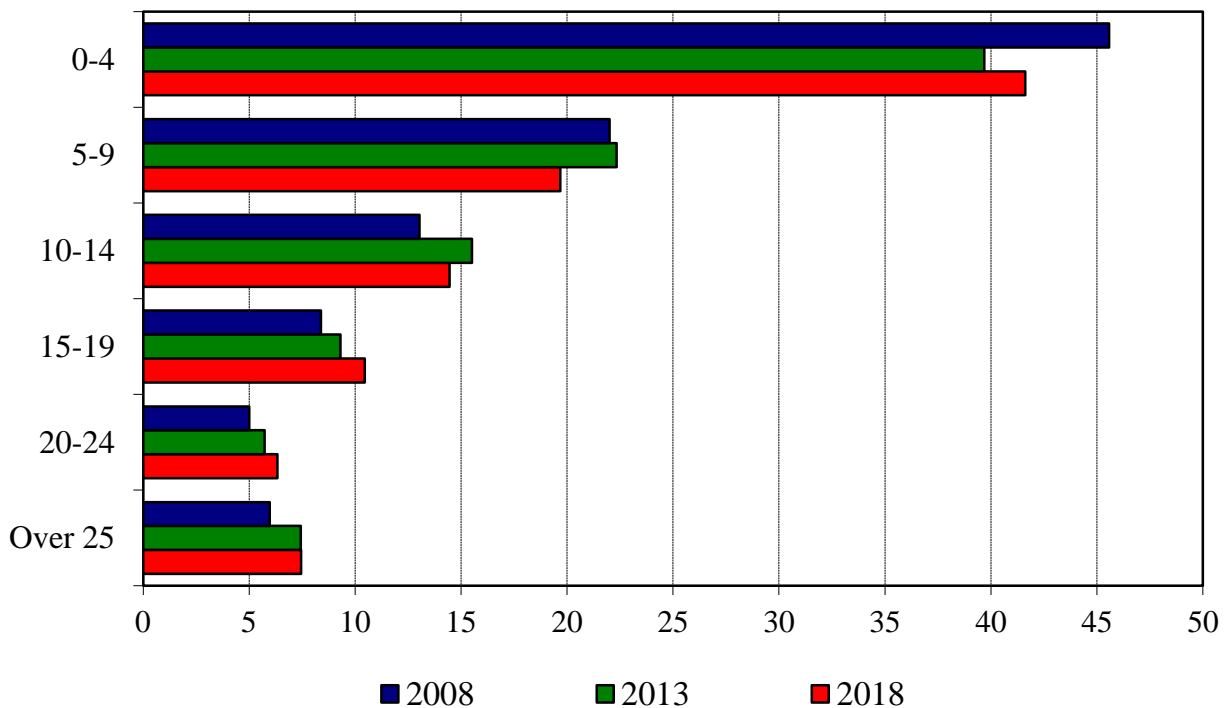


| | | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|-------------------------------|---------------------------------------|------|------|------|------|------|------|------|------|------|-------|
| Total Income (\$Mil) | ■ | 31.3 | 32.9 | 10.8 | 38.7 | 48.5 | 24.5 | 11.5 | 31.7 | 60.4 | -4.7 |
| Benefits and Expenses (\$Mil) | ■ | 6.1 | 6.1 | 6.9 | 7.7 | 7.7 | 8.4 | 9.9 | 11.0 | 10.5 | 13.1 |
| Net Change in MVA (\$Mil) | — | 25.2 | 26.8 | 3.9 | 31.0 | 40.8 | 16.1 | 1.6 | 20.7 | 49.9 | -17.8 |

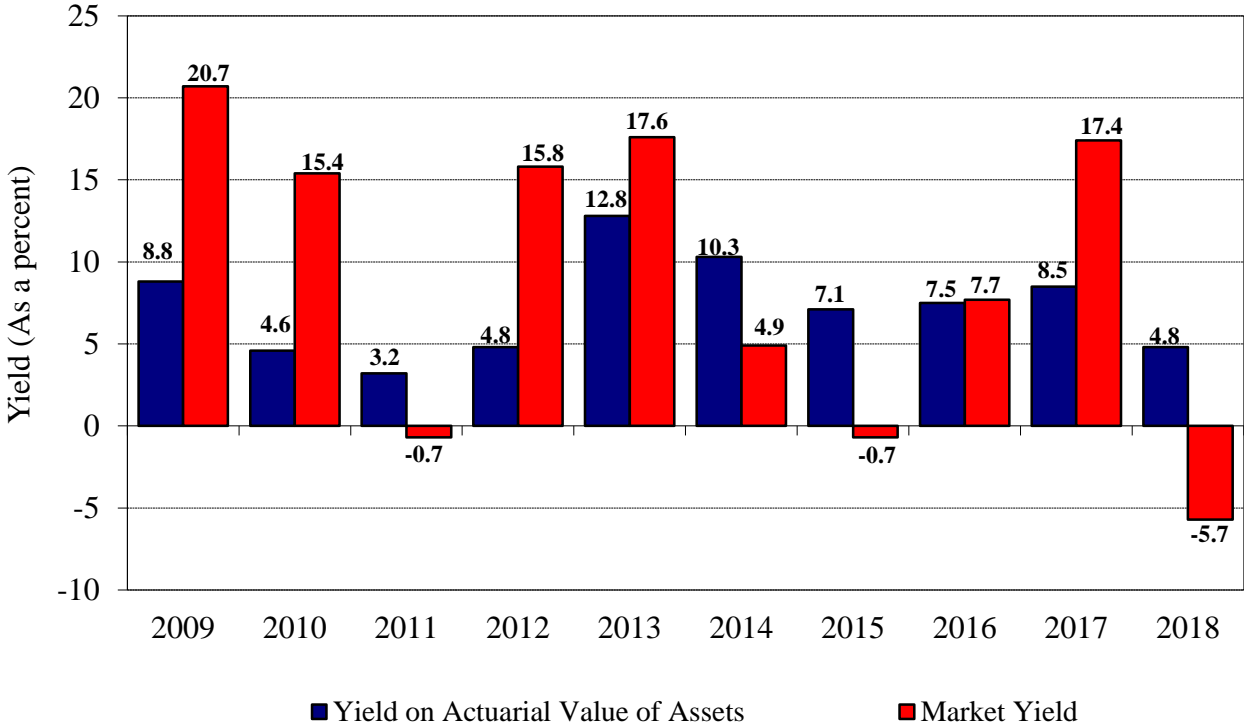
Plan B – Active – Census By Age (as a percent)



Plan B – Active – Census By Service (as a percent)



Plan B – Historical Asset Yield



EXHIBITS

EXHIBIT I
PLAN A: ANALYSIS OF ACTUARIALLY REQUIRED CONTRIBUTIONS

| | |
|--|------------------|
| 1. Present Value of Future Benefits | \$ 4,897,404,869 |
| 2. Funding Deposit Account Credit Balance | \$ 78,847,141 |
| 3. Actuarial Value of Assets | \$ 3,753,426,178 |
| 4. Present Value of Future Employee Contributions | \$ 466,755,194 |
| 5. Present Value of Future Employer Normal Costs (1 + 2 – 3 – 4)..... | \$ 756,070,638 |
| 6. Present Value of Future Salaries..... | \$ 5,458,888,559 |
| 7. Employer Normal Cost Accrual Rate (5 ÷ 6) | 13.850267% |
| 8. Projected Fiscal 2019 Salary for Current Membership..... | \$ 577,391,639 |
| 9. Employer Normal Cost as of January 1, 2019 (7 × 8)..... | \$ 79,970,284 |
| 10. Employer Normal Cost Interest Adjusted for Mid-year Payment | \$ 82,528,403 |
| 11. Estimated Administrative Cost for Fiscal 2019 | \$ 1,686,390 |
| 12. TOTAL Administrative and Interest Adjusted Actuarial Costs (10 + 11)..... | \$ 84,214,793 |
| 13. Estimated Ad Valorem Tax Contributions for Fiscal 2019 | \$ 7,653,690 |
| 14. Estimated Revenue Sharing Funds for Fiscal 2019 | \$ 135,454 |
| 15. Employers' Minimum Net Direct Actuarially Required Contribution for Fiscal 2019 (12 – 13 – 14)..... | \$ 76,425,649 |
| 16. Projected Payroll for Fiscal 2019..... | \$ 627,414,629 |
| 17. Employers' Minimum Net Direct Actuarially Required Contribution as a % of Projected Payroll for Fiscal 2019 (15 ÷ 16) | 12.18% |
| 18. Actual Employer Contribution Rate for Fiscal 2019 | 11.50% |
| 19. Contribution Shortfall (Excess) as a Percentage of Payroll (17 – 18) | 0.68% |
| 20. Increase (Reduction) to Following Year Payment for Contribution Shortfall (Excess)..... | 0.07% |
| 21. Minimum Recommended Net Direct Employer Contribution Rate for Fiscal 2020 (17 + 20, Rounded to Nearest 0.25%)..... | 12.25% |

EXHIBIT II
PLAN A: PRESENT VALUE OF FUTURE BENEFITS

PRESENT VALUE OF FUTURE BENEFITS FOR ACTIVE MEMBERS:

| | |
|--|----------------------|
| Retirement Benefits | \$ 2,611,907,311 |
| Survivor Benefits..... | 45,105,631 |
| Disability Benefits | 102,612,315 |
| Vested Termination Benefits..... | 99,919,874 |
| Refunds of Contributions | 71,483,773 |
| TOTAL Present Value of Future Benefits for Active Members..... | \$ 2,931,028,904 |

PRESENT VALUE OF FUTURE BENEFITS FOR TERMINATED MEMBERS:

| | |
|--|--------------------|
| Terminated Vested Members Due Benefits at Retirement.. | \$ 96,871,471 |
| Terminated Members with Reciprocal Due Benefits at Retirement | 441,908 |
| Terminated Members Due a Refund | 12,909,477 |
| TOTAL Present Value of Future Benefits for Terminated Members..... | \$ 110,222,856 |

PRESENT VALUE OF FUTURE BENEFITS FOR RETIREES:

| | |
|--|----------------------|
| Regular Retirees | |
| Maximum..... | \$ 790,724,271 |
| Option 1 | 2,657,260 |
| Option 2 | 591,485,497 |
| Option 3 | 250,931,113 |
| Option 4 | 67,856,710 |
| TOTAL Regular Retirees | \$ 1,703,654,851 |
| Disability Retirees | 40,645,920 |
| Survivors & Widows | 110,879,376 |
| Reserve for Accrued Retiree DROP Account Balances..... | 972,962 |
| TOTAL Present Value of Future Benefits for Retirees & Survivors..... | \$ 1,856,153,109 |
| TOTAL Present Value of Future Benefits..... | \$ 4,897,404,869 |

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

CURRENT ASSETS:

| | |
|---|---------------|
| Cash in Banks | \$ 19,390,908 |
| Contributions and Taxes Receivable..... | 30,378,332 |
| Accrued Interest and Dividends..... | 956,953 |
| Investments Receivable | 847,854 |
| Due (to)/from other Funds | 561,005 |
| Due (to)/from Plan B | (1,062,257) |
| Deferred Outflows of Resources..... | 10,248 |
| Other Current Assets..... | 13 |

TOTAL CURRENT ASSETS..... \$ 51,083,056

Property Plant & Equipment..... \$ 577,794

INVESTMENTS:

| | |
|-------------------------------|---------------|
| Cash Equivalents..... | \$ 22,466,143 |
| Equities | 1,842,581,974 |
| Fixed Income | 1,204,806,658 |
| Real Estate | 206,098,783 |
| Alternative Investments | 233,131,299 |

TOTAL INVESTMENTS..... \$ 3,509,084,857

TOTAL ASSETS

CURRENT LIABILITIES:

| | |
|---|--------------|
| Accounts Payable..... | \$ 2,096,672 |
| Benefits Payable..... | 15,049,108 |
| Refunds Payable..... | 678,503 |
| Investments Payable..... | 1,044,445 |
| Other Post-Employment Benefits Payable..... | 841,291 |
| Deferred Inflows of Resources | 75,220 |

TOTAL CURRENT LIABILITIES

MARKET VALUE OF ASSETS..... \$ 3,540,960,468

**EXHIBIT III – SCHEDULE B
PLAN A: ACTUARIAL VALUE OF ASSETS**

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

| | |
|----------------------------|------------------|
| Fiscal year 2018 | \$ (469,282,812) |
| Fiscal year 2017 | 339,826,280 |
| Fiscal year 2016 | 21,590,369 |
| Fiscal year 2015 | (247,856,881) |
| Fiscal year 2014 | (70,960,087) |
| Total for five years | \$ (426,683,131) |

Deferral of excess (shortfall) of invested income:

| | |
|-------------------------------|------------------|
| Fiscal year 2018 (80%) | \$ (375,426,250) |
| Fiscal year 2017 (60%) | 203,895,768 |
| Fiscal year 2016 (40%) | 8,636,148 |
| Fiscal year 2015 (20%) | (49,571,376) |
| Fiscal year 2014 (0%) | 0 |
| Total deferred for year | \$ (212,465,710) |

Market value of plan net assets, end of year..... \$ 3,540,960,468

Preliminary actuarial value of plan assets, end of year \$ 3,753,426,178

Actuarial value of assets corridor

| | |
|---|------------------|
| 85% of market value, end of year | \$ 3,009,816,398 |
| 115% of market value, end of year | \$ 4,072,104,538 |

Final actuarial value of plan net assets, end of year \$ 3,753,426,178

EXHIBIT IV
PLAN A: PRESENT VALUE OF FUTURE CONTRIBUTIONS

| | |
|---|-------------------------|
| Employee Contributions to the Annuity Savings Fund | \$ 466,755,194 |
| Employer Normal Contributions to the Pension Accumulation Fund..... | 756,070,638 |
| Funding Deposit Account Debit / (Credit) Balance | (78,847,141) |
| TOTAL PRESENT VALUE OF FUTURE CONTRIBUTIONS | \$ 1,143,978,691 |

EXHIBIT V
PLAN A: RECONCILIATION OF CONTRIBUTIONS

| | |
|--|----------------------|
| Employer Normal Cost for Prior Year..... | \$ 65,620,580 |
| Interest on the Normal Cost..... | 4,429,389 |
| Administrative Expenses | 1,676,178 |
| Interest on Expenses | 55,648 |
| TOTAL Interest Adjusted Actuarially Required Employer Contributions | \$ 71,781,795 |
| Direct Employer Contributions..... | \$ 69,015,634 |
| Interest on Employer Contributions..... | 2,291,244 |
| Ad Valorem Taxes and Revenue Sharing..... | 7,641,523 |
| Interest on Ad Valorem Taxes and Revenue Sharing Funds..... | 253,690 |
| TOTAL Interest Adjusted Employer Contributions | \$ 79,202,091 |
| CONTRIBUTION SURPLUS (DEFICIENCY) | \$ 7,420,296 |

EXHIBIT VI
PLAN A: ANALYSIS OF CHANGE IN ASSETS

| | |
|---|----------------------|
| Actuarial Value of Assets (December 31, 2017) | \$ 3,657,539,805 |
| INCOME: | |
| Member Contributions | \$ 54,385,489 |
| Employer Contributions | 69,015,634 |
| Irregular Contributions | 72,369 |
| Ad Valorem and Revenue Sharing Funds | 7,641,523 |
| Transfer (to)/from Plan B | (1,062,257) |
| Transfers from other Systems..... | 1,769,481 |
| Other Income | 1,412,705 |
| Total Contributions | \$ 133,234,944 |
| Net Depreciation in Fair Value of Investments | \$(255,806,780) |
| Interest & Dividends | 63,559,473 |
| Class Action Settlement | 95,644 |
| Miscellaneous Income | 0 |
| Investment Expense | (21,154,036) |
| Net Investment Income | \$ (213,305,699) |
| TOTAL Income | \$ (80,070,755) |
| EXPENSES: | |
| Retirement Benefits | \$ 174,661,919 |
| DROP Disbursements | 17,023,142 |
| Refunds of Contributions..... | 11,486,631 |
| Transfers to other Systems..... | 3,141,188 |
| Other Benefits | 0 |
| Administrative Expenses | 1,676,178 |
| TOTAL Expenses | \$ 207,989,058 |
| Net Market Value Income for Fiscal 2018 (Income - Expenses) | \$ (288,059,813) |
| Unadjusted Fund Balance as of December 31, 2018 (Fund Balance Previous Year + Net Income)..... | \$ 3,369,479,992 |
| Adjustment for Actuarial Smoothing..... | \$ 383,946,186 |
| Actuarial Value of Assets: (December 31, 2018)..... | \$ 3,753,426,178 |

**EXHIBIT VII
PLAN A: FUNDING DEPOSIT ACCOUNT**

| | |
|---|---------------|
| Funding Deposit Account Balance as of December 31, 2017 | \$ 66,910,393 |
| Interest on Opening Balance at 6.75% | 4,516,452 |
| Contributions to the Funding Deposit Account | 7,420,296 |
| Withdrawals from the Funding Deposit Account | 0 |
| Funding Deposit Account Balance as of December 31, 2018 | \$ 78,847,141 |

**EXHIBIT VIII – SCHEDULE A
PLAN A: PENSION BENEFIT OBLIGATION**

| | |
|--|----------------------|
| Present Value of Credited Projected Benefits Payable to Current Employees..... | \$ 1,862,742,336 |
| Present Value of Benefits Payable to Terminated Employees | 110,222,856 |
| Present Value of Benefits Payable to Current Retirees and Beneficiaries | 1,856,153,109 |
| TOTAL PENSION BENEFIT OBLIGATION | \$ 3,829,118,301 |
| NET ACTUARIAL VALUE OF ASSETS | \$ 3,753,426,178 |
| Ratio of Net Actuarial Value of Assets to Pension Benefit Obligation..... | 98.02% |

**EXHIBIT VIII – SCHEDULE B
PLAN A: ENTRY AGE NORMAL ACCRUED LIABILITIES**

| | |
|--|----------------------|
| Accrued Liability for Active Employees | \$ 1,942,353,769 |
| Accrued Liability for Terminated Employees | 110,222,856 |
| Accrued Liability for Current Retirees and Beneficiaries | 1,856,153,109 |
| TOTAL ENTRY AGE NORMAL ACCRUED LIABILITY | \$ 3,908,729,734 |
| NET ACTUARIAL VALUE OF ASSETS | \$ 3,753,426,178 |
| Ratio of Net Actuarial Value of Assets to Entry Age Normal Accrued Liability | 96.03% |

**EXHIBIT IX
PLAN A: CENSUS DATA**

| | Active | Terminated with Funds on Deposit | DROP | Retired | Total |
|--|---------------|---|-------------|----------------|--------------|
| Number of members as of December 31, 2017 | 13,689 | 8,191 | 512 | 7,301 | 29,693 |
| Additions to Census | | | | | |
| Initial membership | 1,656 | 102 | | | 1,758 |
| Death of another member | | | | 69 | 69 |
| Omitted in error last year | | 4 | | | 4 |
| Adjustment for multiple records | | | | 6 | 6 |
| Change in Status during Year | | | | | |
| Actives terminating service | (736) | 736 | | | |
| Actives who retired | (235) | | | 235 | |
| Actives entering DROP | (229) | | 229 | | |
| Term. members rehired | 42 | (42) | | | |
| Term. members who retire | | (48) | | 48 | |
| Retirees who are rehired | 4 | | | (4) | |
| Refunded who are rehired | 32 | 11 | | | 43 |
| DROP participants retiring | | | (103) | 103 | |
| DROP returned to work | 84 | | (84) | | |
| Omitted in error last year | | | | | |
| Eliminated from Census | | | | | |
| Refund of contributions | (806) | (283) | | | (1,089) |
| Deaths | (25) | (13) | (3) | (290) | (331) |
| Included in error last year | | | | (1) | (1) |
| Adjustment for multiple records | | | | | |
| Number of members as of December 31, 2018 | 13,476 | 8,658 | 551 | 7,467 | 30,152 |

PLAN A - ACTIVES CENSUS BY AGE:

| Age | Number Male | Number Female | Total Number | Average Salary | Total Salary |
|---------|-------------|---------------|--------------|----------------|--------------|
| 16 - 20 | 52 | 21 | 73 | 24,575 | 1,793,953 |
| 21 - 25 | 344 | 305 | 649 | 28,757 | 18,663,004 |
| 26 - 30 | 499 | 615 | 1,114 | 34,462 | 38,390,790 |
| 31 - 35 | 552 | 732 | 1,284 | 40,166 | 51,572,825 |
| 36 - 40 | 644 | 871 | 1,515 | 43,008 | 65,157,102 |
| 41 - 45 | 595 | 746 | 1,341 | 47,200 | 63,295,705 |
| 46 - 50 | 802 | 950 | 1,752 | 47,319 | 82,902,480 |
| 51 - 55 | 1,034 | 1,031 | 2,065 | 47,324 | 97,723,557 |
| 56 - 60 | 992 | 1,047 | 2,039 | 45,997 | 93,788,432 |
| 61 - 65 | 689 | 696 | 1,385 | 47,891 | 66,329,515 |
| 66 - 70 | 283 | 258 | 541 | 45,904 | 24,834,107 |
| 71 - 75 | 126 | 67 | 193 | 43,537 | 8,402,732 |
| 76 - 80 | 33 | 24 | 57 | 44,891 | 2,558,779 |
| 81 - 85 | 11 | 8 | 19 | 24,967 | 474,371 |
| TOTAL | 6,656 | 7,371 | 14,027 | 43,907 | 615,887,352 |

THE ACTIVE CENSUS INCLUDES 7,246 ACTIVES WITH VESTED BENEFITS, INCLUDING 551 DROP PARTICIPANTS AND 363 ACTIVE FORMER DROP PARTICIPANTS.

PLAN A - TERMINATED MEMBERS DUE A DEFERRED RETIREMENT BENEFIT:

| Age | Number Male | Number Female | Total Number | Average Benefit | Total Benefit |
|---------|-------------|---------------|--------------|-----------------|---------------|
| 31 - 35 | 7 | 21 | 28 | 11,316 | 316,836 |
| 36 - 40 | 24 | 33 | 57 | 14,429 | 822,428 |
| 41 - 45 | 31 | 53 | 84 | 17,094 | 1,435,886 |
| 46 - 50 | 47 | 92 | 139 | 18,633 | 2,589,980 |
| 51 - 55 | 84 | 110 | 194 | 19,361 | 3,756,080 |
| 56 - 60 | 81 | 115 | 196 | 18,059 | 3,539,570 |
| 61 - 65 | 39 | 40 | 79 | 11,725 | 926,282 |
| 66 - 70 | 20 | 5 | 25 | 10,124 | 253,100 |
| 71 - 75 | 4 | 1 | 5 | 3,659 | 18,294 |
| 76 - 80 | 2 | 2 | 4 | 4,235 | 16,940 |
| 81 - 85 | 0 | 1 | 1 | 1,713 | 1,713 |
| 86 - 90 | 0 | 1 | 1 | 581 | 581 |
| TOTAL | 339 | 474 | 813 | 16,824 | 13,677,690 |

PLAN A - TERMINATED MEMBERS DUE A REFUND OF CONTRIBUTIONS:

| Contributions Ranging From | To | Number | Total Contributions |
|----------------------------|-------|--------|---------------------|
| 0 | 99 | 4,478 | 121,757 |
| 100 | 499 | 1,200 | 291,283 |
| 500 | 999 | 477 | 344,692 |
| 1000 | 1999 | 385 | 550,881 |
| 2000 | 4999 | 550 | 1,797,869 |
| 5000 | 9999 | 368 | 2,627,449 |
| 10000 | 19999 | 284 | 4,079,063 |
| 20000 | 99999 | 103 | 3,025,050 |
| TOTAL | | 7,845 | 12,838,044 |

PLAN A - REGULAR RETIREES:

| Age | Number Male | Number Female | Total Number | Average Benefit | Total Benefit |
|---------|----------------|------------------|-----------------|--------------------|------------------|
| 46 - 50 | 2 | 1 | 3 | 42,235 | 126,705 |
| 51 - 55 | 52 | 32 | 84 | 56,130 | 4,714,923 |
| 56 - 60 | 237 | 189 | 426 | 47,305 | 20,152,096 |
| 61 - 65 | 561 | 563 | 1,124 | 32,546 | 36,581,338 |
| 66 - 70 | 813 | 703 | 1,516 | 25,933 | 39,314,313 |
| 71 - 75 | 644 | 545 | 1,189 | 22,930 | 27,263,791 |
| 76 - 80 | 479 | 406 | 885 | 19,526 | 17,280,255 |
| 81 - 85 | 301 | 240 | 541 | 16,912 | 9,149,196 |
| 86 - 90 | 157 | 179 | 336 | 14,856 | 4,991,661 |
| 91 - 99 | 61 | 85 | 146 | 12,699 | 1,854,038 |
| TOTAL | 3,307 | 2,943 | 6,250 | 25,829 | 161,428,316 |

PLAN A - DISABILITY RETIREES:

| Age | Number Male | Number Female | Total Number | Average Benefit | Total Benefit |
|---------|----------------|------------------|-----------------|--------------------|------------------|
| 31 - 35 | 1 | 0 | 1 | 12,682 | 12,682 |
| 36 - 40 | 0 | 1 | 1 | 37,571 | 37,571 |
| 41 - 45 | 3 | 2 | 5 | 14,136 | 70,682 |
| 46 - 50 | 13 | 9 | 22 | 17,545 | 385,997 |
| 51 - 55 | 38 | 26 | 64 | 17,940 | 1,148,128 |
| 56 - 60 | 52 | 40 | 92 | 16,809 | 1,546,416 |
| 61 - 65 | 20 | 10 | 30 | 11,125 | 333,745 |
| 66 - 70 | 1 | 1 | 2 | 11,370 | 22,739 |
| TOTAL | 128 | 89 | 217 | 16,396 | 3,557,960 |

PLAN A - SURVIVORS:

| Age | Number Male | Number Female | Total Number | Average Benefit | Total Benefit |
|---------|----------------|------------------|-----------------|--------------------|------------------|
| 0 - 25 | 6 | 15 | 21 | 15,054 | 316,134 |
| 26 - 30 | 1 | 3 | 4 | 20,094 | 80,374 |
| 31 - 35 | 1 | 0 | 1 | 6,958 | 6,958 |
| 36 - 40 | 1 | 3 | 4 | 6,305 | 25,218 |
| 41 - 45 | 2 | 5 | 7 | 16,066 | 112,460 |
| 46 - 50 | 2 | 7 | 9 | 15,586 | 140,274 |
| 51 - 55 | 3 | 23 | 26 | 18,565 | 482,691 |
| 56 - 60 | 11 | 38 | 49 | 16,971 | 831,565 |
| 61 - 65 | 17 | 54 | 71 | 17,648 | 1,253,042 |
| 66 - 70 | 15 | 121 | 136 | 15,620 | 2,124,334 |
| 71 - 75 | 20 | 144 | 164 | 12,714 | 2,085,148 |
| 76 - 80 | 20 | 172 | 192 | 11,573 | 2,221,986 |
| 81 - 85 | 8 | 134 | 142 | 11,571 | 1,643,133 |
| 86 - 90 | 6 | 115 | 121 | 8,699 | 1,052,577 |
| 91 - 99 | 2 | 51 | 53 | 8,346 | 442,314 |
| TOTAL | 115 | 885 | 1,000 | 12,818 | 12,818,208 |

PLAN A - 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 | 63 | 10 | | | | | | | | | | | | | 73 |
| 21 - 25 | 299 | 151 | 99 | 53 | 30 | 17 | | | | | | | | | 649 |
| 26 - 30 | 264 | 213 | 153 | 147 | 116 | 200 | 21 | | | | | | | | 1,114 |
| 31 - 35 | 199 | 157 | 143 | 116 | 109 | 367 | 182 | 11 | | | | | | | 1,284 |
| 36 - 40 | 194 | 155 | 120 | 116 | 96 | 331 | 335 | 147 | 21 | | | | | | 1,515 |
| 41 - 45 | 162 | 106 | 96 | 75 | 55 | 267 | 261 | 206 | 107 | 6 | | | | | 1,341 |
| 46 - 50 | 139 | 121 | 123 | 120 | 87 | 327 | 277 | 238 | 211 | 97 | 12 | | | | 1,752 |
| 51 - 55 | 160 | 130 | 133 | 98 | 94 | 335 | 329 | 242 | 247 | 218 | 79 | | | | 2,065 |
| 56 - 60 | 104 | 110 | 125 | 116 | 87 | 370 | 331 | 254 | 249 | 174 | 119 | | | | 2,039 |
| 61 - 65 | 48 | 33 | 61 | 55 | 47 | 272 | 285 | 204 | 181 | 105 | 94 | | | | 1,385 |
| 66 - 70 | 17 | 11 | 19 | 12 | 7 | 98 | 124 | 72 | 77 | 56 | 48 | | | | 541 |
| 71 & Over | 9 | 3 | 5 | 8 | 6 | 37 | 40 | 44 | 34 | 47 | 36 | | | | 269 |
| Totals | 1,658 | 1,200 | 1,077 | 916 | 734 | 2,621 | 2,185 | 1,418 | 1,127 | 703 | 388 | | | | 14,027 |

PLAN A - 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 | 24,717 | 23,680 | | | | | | | | | | | | | 24,575 |
| 21 - 25 | 26,824 | 29,509 | 30,954 | 28,371 | 33,735 | 35,696 | | | | | | | | | 28,757 |
| 26 - 30 | 28,949 | 33,687 | 33,460 | 36,965 | 38,183 | 38,665 | 40,830 | | | | | | | | 34,462 |
| 31 - 35 | 30,629 | 36,730 | 40,256 | 38,142 | 40,405 | 43,066 | 47,675 | 58,538 | | | | | | | 40,166 |
| 36 - 40 | 32,038 | 36,777 | 39,453 | 37,268 | 42,599 | 44,550 | 50,243 | 50,747 | 50,325 | | | | | | 43,008 |
| 41 - 45 | 35,782 | 36,231 | 44,300 | 41,865 | 42,923 | 43,962 | 53,686 | 57,154 | 56,497 | 56,073 | | | | | 47,200 |
| 46 - 50 | 32,374 | 34,160 | 38,318 | 38,099 | 41,631 | 43,397 | 52,060 | 54,260 | 62,115 | 61,164 | 66,478 | | | | 47,319 |
| 51 - 55 | 31,780 | 34,836 | 41,063 | 39,231 | 42,205 | 46,200 | 45,515 | 50,426 | 56,117 | 61,208 | 63,015 | 47,324 | | | 47,324 |
| 56 - 60 | 32,286 | 35,457 | 45,410 | 41,219 | 35,772 | 41,010 | 41,927 | 50,163 | 52,168 | 58,761 | 66,835 | 45,997 | | | 45,997 |
| 61 - 65 | 36,289 | 37,561 | 49,204 | 40,940 | 43,239 | 43,872 | 42,804 | 49,358 | 52,605 | 63,128 | 60,761 | 47,891 | | | 47,891 |
| 66 - 70 | 36,115 | 34,953 | 56,765 | 33,518 | 33,525 | 42,454 | 43,033 | 44,143 | 50,036 | 51,100 | 56,897 | 45,904 | | | 45,904 |
| 71 & Over | 34,921 | 29,269 | 46,565 | 36,403 | 31,233 | 30,598 | 45,923 | 45,573 | 37,562 | 42,300 | 57,858 | 42,513 | | | 42,513 |
| Average | 30,724 | 34,541 | 40,010 | 38,175 | 40,124 | 42,997 | 47,150 | 51,473 | 54,756 | 58,770 | 62,512 | 43,907 | | | 43,907 |

PLAN A - SERVICE RETIREES:

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 - 50 | 2 | 1 | | | | | | | | | | 3 |
| 51 - 55 | 19 | 17 | 18 | 7 | 11 | 12 | | | | | | 84 |
| 56 - 60 | 57 | 78 | 59 | 57 | 44 | 122 | 9 | | | | | 426 |
| 61 - 65 | 125 | 156 | 158 | 120 | 106 | 308 | 114 | 22 | 8 | 5 | 2 | 1,124 |
| 66 - 70 | 100 | 124 | 131 | 136 | 144 | 556 | 219 | 64 | 21 | 14 | 7 | 1,516 |
| 71 - 75 | 22 | 29 | 40 | 59 | 61 | 434 | 368 | 117 | 41 | 18 | | 1,189 |
| 76 - 80 | 2 | 13 | 17 | 12 | 19 | 132 | 272 | 297 | 77 | 35 | 9 | 885 |
| 81 - 85 | 4 | 2 | 8 | 6 | 9 | 51 | 71 | 135 | 170 | 56 | 29 | 541 |
| 86 - 90 | | 1 | 2 | 1 | | 11 | 21 | 40 | 102 | 109 | 49 | 336 |
| 91 & Over | | | | | | 1 | 4 | 8 | 12 | 48 | 73 | 146 |
| Totals | 331 | 421 | 433 | 398 | 394 | 1,627 | 1,078 | 683 | 431 | 285 | 169 | 6,250 |

PLAN A - AVERAGE ANNUAL BENEFITS PAYABLE TO SERVICE RETIREES:

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 - 50 | 42,603 | 41,500 | | | | | | | | | | 42,235 |
| 51 - 55 | 56,861 | 56,507 | 59,918 | 60,170 | 55,461 | 47,012 | | | | | | 56,130 |
| 56 - 60 | 38,335 | 47,448 | 46,018 | 52,776 | 53,177 | 47,653 | 43,249 | | | | | 47,305 |
| 61 - 65 | 23,971 | 28,692 | 30,796 | 29,421 | 32,694 | 41,433 | 34,444 | 18,923 | 10,919 | 8,600 | 6,331 | 32,546 |
| 66 - 70 | 21,170 | 22,742 | 22,064 | 24,746 | 23,785 | 25,399 | 36,818 | 30,875 | 14,978 | 10,879 | 9,794 | 25,933 |
| 71 - 75 | 21,426 | 23,457 | 18,958 | 19,290 | 23,509 | 21,026 | 23,803 | 29,275 | 27,748 | 18,561 | | 22,930 |
| 76 - 80 | 15,496 | 17,928 | 22,985 | 19,779 | 15,602 | 20,410 | 18,259 | 18,273 | 24,980 | 26,874 | 15,554 | 19,526 |
| 81 - 85 | 18,073 | 31,884 | 17,334 | 9,482 | 13,502 | 18,129 | 14,841 | 15,064 | 15,723 | 24,435 | 22,165 | 16,912 |
| 86 - 90 | | 20,529 | 41,787 | 20,339 | | 18,148 | 10,916 | 12,798 | 14,453 | 12,722 | 21,744 | 14,856 |
| 91 & Over | | | | | | 19,357 | 13,765 | 12,186 | 12,108 | 14,355 | 11,614 | 12,699 |
| Average | 27,307 | 30,871 | 29,841 | 29,593 | 29,676 | 28,411 | 25,457 | 20,333 | 17,994 | 17,242 | 16,433 | 25,829 |

PLAN A - SURVIVING BENEFICIARIES OF FORMER MEMBERS:

Completed Years Since Retirement

| Attained Ages | 0 | 1 | 2 | 3 | 4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30&Over | Total |
|---------------|---|----|----|----|----|-----|-------|-------|-------|-------|---------|-------|
| 0 - 20 | 2 | 1 | 1 | 2 | 2 | 9 | 2 | | 1 | | | 19 |
| 21 - 25 | | | | 1 | | | | | | | | 2 |
| 26 - 30 | | | 1 | | | 2 | 1 | | | | | 4 |
| 31 - 35 | | | | | | | | 1 | | | | 1 |
| 36 - 40 | | 1 | | | | 1 | | | 1 | 1 | | 4 |
| 41 - 45 | | | 1 | | 1 | 3 | 1 | | | | | 7 |
| 46 - 50 | | | | 3 | 2 | 3 | 1 | | | | | 9 |
| 51 - 55 | | 2 | | | 1 | 7 | 8 | 6 | 2 | | | 26 |
| 56 - 60 | 2 | 1 | 1 | 2 | 4 | 13 | 15 | 5 | 4 | 1 | 1 | 49 |
| 61 - 65 | 4 | 6 | 8 | 8 | 5 | 15 | 11 | 6 | 6 | 2 | | 71 |
| 66 - 70 | | 1 | 3 | 3 | 9 | 43 | 41 | 19 | 13 | 3 | 1 | 136 |
| 71 - 75 | | 1 | 2 | 4 | 3 | 24 | 59 | 37 | 29 | 3 | 2 | 164 |
| 76 - 80 | | | 1 | 2 | 1 | 17 | 45 | 63 | 40 | 15 | 8 | 192 |
| 81 - 85 | | | | 1 | 1 | 8 | 16 | 26 | 32 | 34 | 24 | 142 |
| 86 - 90 | | 1 | | 1 | 1 | 5 | 8 | 6 | 28 | 33 | 39 | 121 |
| 91 & Over | | | | 1 | | | 3 | | 6 | 12 | 32 | 53 |
| Totals | 8 | 14 | 18 | 27 | 29 | 150 | 211 | 169 | 162 | 105 | 107 | 1,000 |

PLAN A - 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 | 24,165 | 42,013 | 15,872 | 10,480 | 15,092 | 13,524 | 8,061 | | 6,348 | | | 15,537 |
| 21 - 25 | | | | 14,590 | | | | | | | | 10,469 |
| 26 - 30 | | | 63,598 | | | 7,331 | 2,115 | 6,958 | | | | 20,094 |
| 31 - 35 | | 7,585 | 19,497 | | 63,537 | 6,549 | 4,365 | | 2,395 | 8,689 | | 6,305 |
| 36 - 40 | | | | 19,977 | 13,136 | 6,017 | 9,160 | | | 7,009 | | 16,066 |
| 41 - 45 | | | | | 13,838 | 14,970 | 18,720 | | | | | 15,586 |
| 46 - 50 | | | | | 19,504 | 23,094 | 19,295 | 10,022 | 11,837 | | | 18,565 |
| 51 - 55 | | 36,817 | 46,296 | 32,965 | 16,286 | 16,286 | 11,305 | | 4,944 | 4,683 | 1,303 | 16,971 |
| 56 - 60 | 25,885 | 6,137 | 25,709 | 13,054 | 16,958 | 23,218 | 14,866 | 19,993 | 6,494 | 5,430 | | 17,648 |
| 61 - 65 | 17,455 | 17,794 | 10,693 | 29,684 | 16,130 | 17,637 | 15,678 | 16,193 | 9,138 | 4,293 | 1,543 | 15,620 |
| 66 - 70 | | 15,971 | 18,234 | 13,568 | 18,812 | 10,961 | 13,348 | 14,178 | 11,132 | 4,390 | | 12,714 |
| 71 - 75 | | 7,455 | 3,788 | 5,285 | 9,503 | 9,005 | 11,862 | 11,184 | 11,859 | 14,795 | 13,797 | 11,573 |
| 76 - 80 | | | | 15,648 | 4,105 | 14,220 | 13,371 | 11,141 | 11,694 | 11,900 | 9,468 | 11,571 |
| 81 - 85 | | 6,052 | | 6,374 | | 14,253 | 8,878 | 10,199 | 9,635 | 7,221 | 8,426 | 8,699 |
| 86 - 90 | | | | | | | 8,128 | | 13,190 | 10,201 | 6,762 | 8,346 |
| 91 & Over | | | | | | | | | | | | |
| Average | 21,240 | 18,972 | 23,515 | 16,361 | 17,650 | 15,247 | 13,782 | 12,611 | 10,680 | 9,948 | 8,456 | 12,818 |

EXHIBIT X
PLAN A: YEAR-TO-YEAR COMPARISON

| | Fiscal 2018 | Fiscal 2017 | Fiscal 2016 | Fiscal 2015 |
|--|------------------|------------------|------------------|------------------|
| Number of Active Members | 14,027 | 14,201 | 14,330 | 14,232 |
| Number of Retirees & Survivors | 7,467 | 7,301 | 7,050 | 6,783 |
| Number of Terminated Due Deferred Benefits | 813 | 709 | 703 | 678 |
| Number Terminated Due Refunds | 7,845 | 7,482 | 7,329 | 7,182 |
| Active Lives Payroll | \$ 615,887,352 | \$ 605,199,478 | \$ 599,421,070 | \$ 577,600,460 |
| Retiree Benefits in Payment | \$ 177,804,484 | \$ 170,697,910 | \$ 157,140,568 | \$ 146,994,479 |
| Market Value of Assets | \$ 3,540,960,468 | \$ 3,829,020,281 | \$ 3,313,917,014 | \$ 3,124,593,132 |
| Entry Age Normal (EAN) Accrued Liability | \$ 3,908,729,734 | \$ 3,676,214,901 | \$ 3,446,813,538 | \$ 3,316,128,533 |
| Ratio of AVA to EAN Accrued Liability | 96.03% | 99.49% | 99.20% | 97.11% |
| Actuarial Value of Assets | \$ 3,753,426,178 | \$ 3,657,539,805 | \$ 3,419,149,648 | \$ 3,220,157,028 |
| Present Value of Future Employer Normal Cost | \$ 756,070,638 | \$ 604,529,232 | \$ 555,155,571 | \$ 592,955,250 |
| Present Value of Future Employee Contrib. | \$ 466,755,194 | \$ 437,372,887 | \$ 422,091,697 | \$ 405,879,187 |
| Funding Deposit Account Credit Balance | \$ 78,847,141 | \$ 66,910,393 | \$ 68,896,088 | \$ 49,644,401 |
| Frozen Unfunded Actuarial Accrued Liability | \$ 0 | \$ 0 | \$ 0 | \$ 0 |
| Present Value of Future Benefits | \$ 4,897,404,869 | \$ 4,632,531,531 | \$ 4,327,500,828 | \$ 4,169,347,064 |

| | Fiscal 2019 | Fiscal 2018 | Fiscal 2017 | Fiscal 2016 |
|--|-------------|-------------|-------------|-------------|
| Employee Contribution Rate | 9.50% | 9.50% | 9.50% | 9.50% |
| Projected Tax Contribution as % of Payroll | 1.24% | 1.22% | 1.22% | 1.27% |
| Actuarially Required Net Direct Employer Contribution Rate | 12.18% | 9.99% | 9.35% | 10.52% |
| Actual Employer Contribution Rate | 11.50% | 11.50% | 12.50% | 13.00% |

| Fiscal 2014 | Fiscal 2013 | Fiscal 2012 | Fiscal 2011 | Fiscal 2010 | Fiscal 2009 |
|------------------|------------------|------------------|------------------|------------------|------------------|
| 14,061 | 13,866 | 14,370 | 14,646 | 14,791 | 14,795 |
| 6,523 | 6,242 | 5,991 | 5,718 | 5,531 | 5,413 |
| 660 | 683 | 561 | 561 | 556 | 562 |
| 7,026 | 7,109 | 6,795 | 6,795 | 6,762 | 6,611 |
| \$ 566,547,812 | \$ 543,669,542 | \$ 558,327,346 | \$ 552,543,155 | \$ 546,737,427 | \$ 536,408,372 |
| \$ 137,309,161 | \$ 124,299,785 | \$ 114,515,106 | \$ 104,683,495 | \$ 97,650,642 | \$ 90,207,961 |
| \$ 3,175,649,999 | \$ 3,043,479,814 | \$ 2,583,983,506 | \$ 2,230,462,425 | \$ 2,225,041,407 | \$ 1,904,114,041 |
| \$ 3,133,179,431 | \$ 2,984,143,643 | \$ 2,823,038,820 | \$ 2,682,634,009 | \$ 2,553,982,211 | \$ 2,358,101,301 |
| 96.80% | 92.49% | 86.73% | 87.38% | 88.46% | 90.55% |
| \$ 3,032,888,183 | \$ 2,760,148,403 | \$ 2,448,529,177 | \$ 2,344,047,017 | \$ 2,259,207,052 | \$ 2,135,230,590 |
| \$ 560,647,763 | \$ 651,806,943 | \$ 773,908,389 | \$ 724,810,561 | \$ 669,371,250 | \$ 552,376,261 |
| \$ 389,156,042 | \$ 370,352,485 | \$ 378,465,400 | \$ 373,626,178 | \$ 370,489,102 | \$ 355,947,027 |
| \$ 23,781,823 | \$ 4,918,053 | \$ 4,574,933 | \$ 29,274,204 | \$ 27,231,818 | \$ 25,331,924 |
| \$ 0 | \$ 0 | \$ 0 | \$ 36,903,336 | \$ 45,756,457 | \$ 53,552,388 |
| \$ 3,958,910,165 | \$ 3,777,389,778 | \$ 3,596,328,033 | \$ 3,450,112,888 | \$ 3,317,592,043 | \$ 3,071,774,342 |

| Fiscal 2015 | Fiscal 2014 | Fiscal 2013 | Fiscal 2012 | Fiscal 2011 | Fiscal 2010 |
|-------------|-------------|-------------|-------------|-------------|-------------|
| 9.50% | 9.50% | 9.50% | 9.50% | 9.50% | 9.50% |
| 1.28% | 1.32% | 1.16% | 1.09% | 1.05% | 1.13% |
| 10.40% | 13.07% | 15.56% | 16.72% | 15.58% | 13.46% |
| 14.50% | 16.00% | 16.75% | 15.75% | 15.75% | 15.75% |

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EXHIBIT XI
PLAN B: ANALYSIS OF ACTUARIALLY REQUIRED CONTRIBUTIONS

| | | | |
|-----|--|----|-------------|
| 1. | Present Value of Future Benefits | \$ | 429,603,067 |
| 2. | Funding Deposit Account Credit Balance | \$ | 6,220,583 |
| 3. | Actuarial Value of Assets | \$ | 326,300,632 |
| 4. | Present Value of Future Employee Contributions | \$ | 25,843,520 |
| 5. | Present Value of Future Employer Normal Costs (1 + 2 – 3 – 4)..... | \$ | 83,679,498 |
| 6. | Present Value of Future Salaries | \$ | 929,519,172 |
| 7. | Employer Normal Cost Accrual Rate (5 ÷ 6) | | 9.002450% |
| 8. | Projected Fiscal 2019 Salary for Current Membership..... | \$ | 98,756,322 |
| 9. | Employer Normal Cost as of January 1, 2019 (7 × 8) | \$ | 8,890,489 |
| 10. | Employer Normal Cost Interest Adjusted for Mid-year Payment | \$ | 9,174,881 |
| 11. | Estimated Administrative Cost for Fiscal 2019 | \$ | 290,011 |
| 12. | TOTAL Administrative and Interest Adjusted Actuarial Costs (10 + 11)..... | \$ | 9,464,892 |
| 13. | Estimated Ad Valorem Tax Contributions for Fiscal 2019 | \$ | 1,316,214 |
| 14. | Estimated Revenue Sharing Funds for Fiscal 2019 | \$ | 23,294 |
| 15. | Employers' Minimum Net Direct Actuarially Required Contribution for Fiscal 2019 (12 – 13 – 14)..... | \$ | 8,125,384 |
| 16. | Projected Payroll for Fiscal 2019..... | \$ | 107,903,460 |
| 17. | Employers' Minimum Net Direct Actuarially Required Contribution as a % of Projected Payroll for Fiscal 2019 (15 ÷ 16) | | 7.53% |
| 18. | Actual Employer Contribution Rate for Fiscal 2019 | | 7.50% |
| 19. | Contribution Shortfall (Excess) as a Percentage of Payroll (17 – 18) | | 0.03% |
| 20. | Increase (Reduction) to Following Year Payment for Contribution Shortfall (Excess) | | 0.00% |
| 21. | Minimum Recommended Net Direct Employer Contribution Rate for Fiscal 2020 (17 + 20, Rounded to Nearest 0.25%) | | 7.50% |

EXHIBIT XII
PLAN B: PRESENT VALUE OF FUTURE BENEFITS

PRESENT VALUE OF FUTURE BENEFITS FOR ACTIVE MEMBERS:

| | |
|--|--------------------|
| Retirement Benefits | \$ 270,070,061 |
| Survivor Benefits | 5,206,711 |
| Disability Benefits | 13,015,724 |
| Vested Termination Benefits | 10,948,480 |
| Refunds of Contributions | 3,865,640 |
| TOTAL Present Value of Future Benefits for Active Members..... | \$ 303,106,616 |

PRESENT VALUE OF FUTURE BENEFITS FOR TERMINATED MEMBERS:

| | |
|---|-------------------|
| Terminated Vested Members Due Benefits at Retirement | \$ 11,650,814 |
| Terminated Members with Reciprocals | |
| Due Benefits at Retirement | 172,187 |
| Terminated Members Due a Refund | 915,625 |
| TOTAL Present Value of Future Benefits for Terminated Members | \$ 12,738,626 |

PRESENT VALUE OF FUTURE BENEFITS FOR PENSIONERS:

Regular Retirees by Option Selected:

| | |
|--|--------------------|
| Maximum..... | \$ 49,503,650 |
| Option 1 | 250,761 |
| Option 2 | 39,960,206 |
| Option 3 | 9,788,178 |
| Option 4 | 1,097,077 |
| TOTAL Regular Retirees..... | \$ 100,599,872 |
| TOTAL Disability Retirees..... | \$ 2,822,143 |
| TOTAL Survivors & Widows | \$ 10,304,249 |
| Reserve for Accrued Retiree DROP Account Balances | \$ 31,561 |
| TOTAL Present Value of Future Benefits for Retirees & Survivors..... | \$ 113,757,825 |
| TOTAL Present Value of Future Benefits..... | \$ 429,603,067 |

**EXHIBIT XIII – SCHEDULE A
PLAN B: MARKET VALUE OF ASSETS**

CURRENT ASSETS:

| | |
|---|--------------|
| Cash in Banks | \$ 6,271,679 |
| Contributions and Taxes Receivable..... | 2,951,738 |
| Accrued Interest and Dividends..... | 102,153 |
| Investments Receivable | 69,573 |
| Due (to)/from other Funds | (561,005) |
| Due (to)/from Plan A | 1,062,257 |
| Other Current Assets..... | 7,519 |

TOTAL CURRENT ASSETS..... \$ 9,903,914

Property Plant & Equipment..... \$ 86,675

INVESTMENTS:

| | |
|-------------------------------|---------------|
| Cash Equivalents..... | \$ 12,282,878 |
| Equities | 150,823,503 |
| Fixed Income | 99,508,366 |
| Real Estate | 17,032,197 |
| Alternative Investments | 19,435,993 |

TOTAL INVESTMENTS..... \$ 299,082,937

TOTAL ASSETS \$ 309,073,526

CURRENT LIABILITIES:

| | |
|--------------------------|------------|
| Retirements Payable..... | \$ 176,390 |
| Accounts Payable..... | 951,599 |
| Investments Payable..... | 55,328 |
| Refunds Payable..... | 89,452 |

TOTAL CURRENT LIABILITIES \$ 1,272,769

MARKET VALUE OF ASSETS..... \$ 307,800,757

**EXHIBIT XIII – SCHEDULE B
PLAN B: ACTUARIAL VALUE OF ASSETS**

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

| | |
|----------------------------|-----------------|
| Fiscal year 2018 | \$ (40,486,193) |
| Fiscal year 2017 | 28,697,360 |
| Fiscal year 2016 | 1,827,421 |
| Fiscal year 2015 | (20,301,524) |
| Fiscal year 2014 | (5,626,226) |
| Total for five years | \$ (35,889,162) |

Deferral of excess (shortfall) of invested income:

| | |
|-------------------------------|-----------------|
| Fiscal year 2018 (80%) | \$ (32,388,954) |
| Fiscal year 2017 (60%) | 17,218,416 |
| Fiscal year 2016 (40%) | 730,968 |
| Fiscal year 2015 (20%) | (4,060,305) |
| Fiscal year 2014 (0%) | 0 |
| Total deferred for year | \$ (18,499,875) |

Market value of plan net assets, end of year..... \$ 307,800,757

Preliminary actuarial value of plan assets, end of year \$ 326,300,632

Actuarial value of assets corridor

| | |
|---|----------------|
| 85% of market value, end of year | \$ 261,630,643 |
| 115% of market value, end of year | \$ 353,970,871 |

Final actuarial value of plan net assets, end of year \$ 326,300,632

EXHIBIT XIV
PLAN B: PRESENT VALUE OF FUTURE CONTRIBUTIONS

| | |
|---|--------------------|
| Employee Contributions to the Annuity Savings Fund | \$ 25,843,520 |
| Employer Normal Contributions to the Pension Accumulation Fund..... | 83,679,498 |
| Funding Deposit Account Debit / (Credit) Balance | (6,220,583) |
| TOTAL PRESENT VALUE OF FUTURE CONTRIBUTIONS | \$ 103,302,435 |

EXHIBIT XV
PLAN B: RECONCILIATION OF CONTRIBUTIONS

| | |
|---|------------------|
| Employer Normal Cost for Prior Year..... | \$ 8,161,388 |
| Interest on Normal Cost..... | 550,894 |
| Administrative Expenses | 245,050 |
| Interest on Expenses | 8,136 |
| TOTAL Interest Adjusted Actuarially Required Employer Contributions | \$ 8,965,468 |
| Direct Employer Contributions..... | \$ 7,846,175 |
| Interest on Employer Contributions..... | 260,485 |
| Ad Valorem Taxes and Revenue Sharing Funds | 1,311,932 |
| Interest on Taxes and Revenue Sharing Funds..... | 43,555 |
| TOTAL Interest Adjusted Employer Contributions | \$ 9,462,147 |
| CONTRIBUTION SURPLUS (DEFICIENCY) | \$ 496,679 |

EXHIBIT XVI
PLAN B: ANALYSIS OF CHANGE IN ASSETS

| | | |
|---|----|----------------|
| Actuarial Value of Assets (December 31, 2017) | \$ | 310,818,392 |
| INCOME: | | |
| Member Contributions | \$ | 3,047,834 |
| Employer Contributions | | 7,846,175 |
| Irregular Contributions | | 631 |
| Ad Valorem Taxes and Revenue Sharing | | 1,311,932 |
| Transfers (to)/from Plan A | | 1,062,257 |
| Transfers from other Systems..... | | 441,769 |
| Other Income | | 63,627 |
| Total Contributions | \$ | 13,774,225 |
| Net Depreciation in Fair Value of Investments | \$ | (22,084,289) |
| Interest & Dividends | | 5,439,759 |
| Class Action Settlement..... | | 8,280 |
| Miscellaneous Investment Income | | 0 |
| Investment Expense | | (1,848,271) |
| Net Investment Income | \$ | (18,484,521) |
| TOTAL Income | \$ | (4,710,296) |
| EXPENSES: | | |
| Retirement Benefits | \$ | 10,968,510 |
| DROP Disbursements | | 1,003,683 |
| Refunds of Contributions..... | | 681,290 |
| Transfers to other Systems..... | | 217,292 |
| Other Benefits | | 0 |
| Administrative Expenses | | 245,050 |
| TOTAL Expenses | \$ | 13,115,825 |
| Net Market Value Income for Fiscal 2018 (Income - Expenses) | \$ | (\$17,826,121) |
| Unadjusted Fund Balance as of December 31, 2018 (Fund Balance Previous Year + Net Income)..... | \$ | 292,992,271 |
| Adjustment for Actuarial Smoothing..... | \$ | 33,308,361 |
| Actuarial Value of Assets (December 31, 2018) | \$ | 326,300,632 |

EXHIBIT XVII
PLAN B: FUNDING DEPOSIT ACCOUNT

| | | |
|---|----|-----------|
| Funding Deposit Account Balance as of December 31, 2017 | \$ | 5,361,971 |
| Interest on Opening Balance at 6.75% | | 361,933 |
| Contributions to the Funding Deposit Account | | 496,679 |
| Withdrawals from the Funding Deposit Account | | 0 |
| Funding Deposit Account Balance as of December 31, 2018 | \$ | 6,220,583 |

EXHIBIT XVIII – SCHEDULE A
PLAN B: PENSION BENEFIT OBLIGATION

| | | |
|--|--------|-----------------|
| Present Value of Credited Projected Benefits Payable to Current Employees..... | \$ | 184,496,962 |
| Present Value of Benefits Payable to Terminated Employees | | 12,738,626 |
| Present Value of Benefits Payable to Current Retirees and Beneficiaries | | 113,757,825 |
| TOTAL PENSION BENEFIT OBLIGATION..... | \$ | 310,993,413 |
| NET ACTUARIAL VALUE OF ASSETS | \$ | 326,300,632 |
| Ratio of Net Actuarial Value of Assets to Pension Benefit Obligation..... | | 104.92% |

EXHIBIT XVIII – SCHEDULE B
PLAN B: ENTRY AGE NORMAL ACCRUED LIABILITIES

| | | |
|--|--------|-----------------|
| Accrued Liability for Active Employees | \$ | 202,746,767 |
| Accrued Liability for Terminated Employees | | 12,738,626 |
| Accrued Liability for Current Retirees and Beneficiaries | | 113,757,825 |
| TOTAL ENTRY AGE NORMAL ACCRUED LIABILITY | \$ | 329,243,218 |
| NET ACTUARIAL VALUE OF ASSETS | \$ | 326,300,632 |
| Ratio of Net Actuarial Value of Assets to Entry Age Normal Accrued Liability | | 99.11% |

EXHIBIT XIX
PLAN B: CENSUS DATA

| | Active | Terminated with Funds on Deposit | DROP | Retired | Total |
|--|---------------|---|-------------|----------------|--------------|
| Number of members as of December 31, 2017 | 2,373 | 1,779 | 86 | 855 | 5,093 |
| Additions to Census | | | | | |
| Initial membership | 304 | 8 | | | 312 |
| Death of Another Member | | | | 15 | 15 |
| Omitted in error last year | | | | | |
| Adjustment for multiple records | | | | 1 | 1 |
| Change in Status during Year | | | | | |
| Actives terminating service | (148) | 148 | | | |
| Actives who retired | (49) | | | 49 | |
| Actives entering DROP | (39) | | 39 | | |
| Term. members rehired | 13 | (13) | | | |
| Term. members who retire | | (11) | | 11 | |
| Retirees who are rehired | | | | | |
| Refunded who are rehired | 6 | 1 | | | 7 |
| DROP participants retiring | | | (13) | 13 | |
| DROP returned to work | 19 | | (19) | | |
| Omitted in error last year | | | | | |
| Eliminated from Census | | | | | |
| Refund of contributions | (136) | (49) | | | (185) |
| Deaths | (5) | (1) | (2) | (46) | (54) |
| Included in error last year | | | | (2) | (2) |
| Adjustment for multiple records | | | | | |
| Number of members as of December 31, 2018 | 2,338 | 1,862 | 91 | 896 | 5,187 |

PLAN B - ACTIVES CENSUS BY AGE:

| Age | Number Male | Number Female | Total Number | Average Salary | Total Salary |
|---------|----------------|------------------|-----------------|-------------------|-----------------|
| 16 - 20 | 11 | 4 | 15 | 25,760 | 386,398 |
| 21 - 25 | 69 | 53 | 122 | 32,274 | 3,937,470 |
| 26 - 30 | 73 | 117 | 190 | 34,733 | 6,599,327 |
| 31 - 35 | 84 | 129 | 213 | 38,599 | 8,221,490 |
| 36 - 40 | 111 | 156 | 267 | 42,750 | 11,414,123 |
| 41 - 45 | 89 | 139 | 228 | 46,447 | 10,589,966 |
| 46 - 50 | 131 | 164 | 295 | 45,338 | 13,374,838 |
| 51 - 55 | 164 | 185 | 349 | 45,636 | 15,927,044 |
| 56 - 60 | 197 | 161 | 358 | 46,302 | 16,576,199 |
| 61 - 65 | 135 | 115 | 250 | 47,403 | 11,850,826 |
| 66 - 70 | 59 | 37 | 96 | 47,949 | 4,603,108 |
| 71 - 75 | 26 | 11 | 37 | 53,682 | 1,986,217 |
| 76 - 80 | 8 | 1 | 9 | 49,767 | 447,899 |
| TOTAL | 1,157 | 1,272 | 2,429 | 43,604 | 105,914,905 |

THE ACTIVE CENSUS INCLUDES 1,202 ACTIVES WITH VESTED BENEFITS, INCLUDING 91 DROP PARTICIPANTS AND 52 ACTIVE FORMER DROP PARTICIPANTS.

PLAN B - TERMINATED MEMBERS DUE A DEFERRED RETIREMENT BENEFIT:

| Age | Number Male | Number Female | Total Number | Average Benefit | Total Benefit |
|---------|----------------|------------------|-----------------|--------------------|------------------|
| 26 - 30 | 1 | 1 | 2 | 4,430 | 8,859 |
| 31 - 35 | 4 | 2 | 6 | 9,722 | 58,329 |
| 36 - 40 | 6 | 8 | 14 | 7,332 | 102,648 |
| 41 - 45 | 5 | 7 | 12 | 8,549 | 102,586 |
| 46 - 50 | 7 | 16 | 23 | 12,853 | 295,614 |
| 51 - 55 | 13 | 20 | 33 | 15,737 | 519,330 |
| 56 - 60 | 20 | 14 | 34 | 9,380 | 318,922 |
| 61 - 65 | 10 | 11 | 21 | 6,957 | 146,101 |
| 66 - 70 | 2 | 6 | 8 | 7,207 | 57,654 |
| 76 - 80 | 0 | 1 | 1 | 499 | 499 |
| TOTAL | 68 | 86 | 154 | 10,458 | 1,610,542 |

PLAN B - TERMINATED MEMBERS DUE A REFUND OF CONTRIBUTIONS:

| Contributions Ranging From | To | Number | Total Contributions |
|-------------------------------|-------|--------|------------------------|
| 0 | 99 | 1,070 | 27,175 |
| 100 | 499 | 301 | 74,648 |
| 500 | 999 | 104 | 73,411 |
| 1000 | 1999 | 83 | 124,978 |
| 2000 | 4999 | 112 | 348,942 |
| 5000 | 9999 | 35 | 230,234 |
| 10000 | 19999 | 3 | 36,237 |
| TOTAL | | 1,708 | 915,625 |

PLAN B - REGULAR RETIREES:

| Age | Number Male | Number Female | Total Number | Average Benefit | Total Benefit |
|---------|----------------|------------------|-----------------|--------------------|------------------|
| 56 - 60 | 8 | 10 | 18 | 23,886 | 429,956 |
| 61 - 65 | 66 | 68 | 134 | 17,818 | 2,387,555 |
| 66 - 70 | 110 | 92 | 202 | 14,633 | 2,955,794 |
| 71 - 75 | 83 | 73 | 156 | 11,766 | 1,835,520 |
| 76 - 80 | 63 | 48 | 111 | 10,989 | 1,219,824 |
| 81 - 85 | 38 | 36 | 74 | 9,760 | 722,234 |
| 86 - 90 | 6 | 20 | 26 | 8,894 | 231,251 |
| 91 - 99 | 3 | 13 | 16 | 7,872 | 125,952 |
| TOTAL | 377 | 360 | 737 | 13,444 | 9,908,086 |

PLAN B - DISABILITY RETIREES:

| Age | Number Male | Number Female | Total Number | Average Benefit | Total Benefit |
|---------|----------------|------------------|-----------------|--------------------|------------------|
| 41 - 45 | 1 | 0 | 1 | 5,293 | 5,293 |
| 46 - 50 | 1 | 1 | 2 | 11,170 | 22,339 |
| 51 - 55 | 4 | 3 | 7 | 10,632 | 74,424 |
| 56 - 60 | 5 | 6 | 11 | 10,318 | 113,497 |
| 61 - 65 | 0 | 3 | 3 | 7,026 | 21,079 |
| TOTAL | 11 | 13 | 24 | 9,860 | 236,632 |

PLAN B - SURVIVORS:

| Age | Number Male | Number Female | Total Number | Average Benefit | Total Benefit |
|---------|----------------|------------------|-----------------|--------------------|------------------|
| 36 - 40 | 0 | 1 | 1 | 3,490 | 3,490 |
| 41 - 45 | 1 | 1 | 2 | 7,271 | 14,541 |
| 51 - 55 | 1 | 1 | 2 | 8,754 | 17,507 |
| 56 - 60 | 0 | 8 | 8 | 11,482 | 91,857 |
| 61 - 65 | 1 | 21 | 22 | 8,842 | 194,521 |
| 66 - 70 | 1 | 17 | 18 | 7,516 | 135,284 |
| 71 - 75 | 2 | 24 | 26 | 10,881 | 282,906 |
| 76 - 80 | 0 | 29 | 29 | 7,905 | 229,244 |
| 81 - 85 | 2 | 15 | 17 | 5,822 | 98,981 |
| 86 - 90 | 0 | 6 | 6 | 3,294 | 19,766 |
| 91 - 99 | 1 | 3 | 4 | 2,794 | 11,177 |
| TOTAL | 9 | 126 | 135 | 8,143 | 1,099,274 |

PLAN B - 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 | 13 | 1 | | | | | | | | | | | 15 |
| 21 - 25 | 53 | 41 | 14 | 9 | 3 | 2 | | | | | | | 122 |
| 26 - 30 | 50 | 35 | 26 | 29 | 18 | 30 | 2 | | | | | | 190 |
| 31 - 35 | 44 | 37 | 19 | 14 | 15 | 61 | 23 | | | | | | 213 |
| 36 - 40 | 34 | 25 | 22 | 18 | 14 | 69 | 54 | 27 | 4 | | | | 267 |
| 41 - 45 | 30 | 29 | 12 | 11 | 9 | 58 | 37 | 36 | 6 | | | | 228 |
| 46 - 50 | 29 | 25 | 14 | 13 | 16 | 52 | 52 | 45 | 28 | 19 | 2 | | 295 |
| 51 - 55 | 26 | 27 | 15 | 27 | 22 | 58 | 50 | 40 | 44 | 18 | 22 | | 349 |
| 56 - 60 | 19 | 18 | 21 | 27 | 11 | 66 | 60 | 43 | 36 | 25 | 32 | | 358 |
| 61 - 65 | 4 | 8 | 7 | 19 | 12 | 59 | 45 | 35 | 22 | 17 | 22 | | 250 |
| 66 - 70 | 3 | 5 | 5 | 2 | 6 | 16 | 17 | 19 | 9 | 6 | 8 | | 96 |
| 71 & Over | | | 2 | 2 | | 7 | 11 | 9 | 5 | 2 | 8 | | 46 |
| Totals | 305 | 251 | 158 | 171 | 126 | 478 | 351 | 254 | 154 | 87 | 94 | | 2,429 |

PLAN B - 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 | 26,155 | 25,475 | 20,902 | | | | | | | | | | 25,760 |
| 21 - 25 | 33,709 | 29,967 | 35,518 | 30,958 | 25,922 | 34,292 | | | | | | | 32,274 |
| 26 - 30 | 30,640 | 31,632 | 37,183 | 39,979 | 33,182 | 39,183 | 30,649 | | | | | | 34,733 |
| 31 - 35 | 32,437 | 37,169 | 33,699 | 41,439 | 40,821 | 43,267 | 41,186 | | | | | | 38,599 |
| 36 - 40 | 33,222 | 39,405 | 44,205 | 39,169 | 38,249 | 45,577 | 46,455 | 45,701 | 49,774 | | | | 42,750 |
| 41 - 45 | 35,933 | 40,058 | 32,101 | 42,402 | 50,959 | 50,743 | 58,556 | 44,101 | 57,128 | | | | 46,447 |
| 46 - 50 | 34,560 | 33,612 | 46,501 | 50,914 | 50,409 | 45,552 | 44,617 | 47,028 | 52,975 | 52,647 | 62,092 | | 45,338 |
| 51 - 55 | 34,815 | 34,639 | 43,165 | 36,717 | 35,460 | 48,376 | 48,622 | 47,935 | 54,649 | 53,229 | 52,303 | | 45,636 |
| 56 - 60 | 29,125 | 36,875 | 46,205 | 39,768 | 41,410 | 40,983 | 50,072 | 47,655 | 47,772 | 54,288 | 63,255 | | 46,302 |
| 61 - 65 | 33,500 | 32,215 | 45,906 | 39,171 | 45,659 | 44,161 | 52,443 | 46,065 | 50,447 | 55,506 | 55,204 | | 47,403 |
| 66 - 70 | 30,562 | 37,893 | 63,737 | 34,250 | 38,698 | 43,820 | 65,365 | 35,385 | 59,611 | 51,003 | 46,929 | | 47,949 |
| 71 & Over | | | 46,447 | 41,695 | | 60,456 | 44,879 | 53,943 | 59,997 | 57,196 | 55,138 | | 52,916 |
| Average | 32,721 | 34,939 | 41,042 | 39,840 | 40,506 | 45,147 | 49,584 | 45,962 | 52,570 | 53,789 | 56,702 | | 43,604 |

PLAN B -- 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 - 25 | | | | | | | | | | | | | 0 |
| 26 - 30 | | | | | | | | | | | | | 2 |
| 31 - 35 | | | | | | | | | | | | | 2 |
| 36 - 40 | 1 | | | | | | | | 2 | 4 | | | 6 |
| 41 - 45 | | | | | | | | | 5 | 8 | | | 14 |
| 46 - 50 | | | | | | | | | 2 | 1 | | | 12 |
| 51 - 55 | | 3 | | | | | 15 | 6 | | | | | 23 |
| 56 - 60 | 5 | 7 | 5 | 5 | 4 | 25 | 4 | 6 | | | | | 33 |
| 61 - 65 | 10 | 1 | 1 | 5 | 2 | 7 | 1 | 1 | | | | | 34 |
| 66 - 70 | 6 | 2 | | 5 | | 2 | | | | | | | 21 |
| 71 - 75 | | | | | | | | | | | | | 8 |
| 76 - 80 | 1 | | | | | | | | | | | | 0 |
| 81 & Over | | | | | | | | | | | | | 1 |
| Totals | 23 | 13 | 6 | 10 | 6 | 34 | 20 | 13 | 9 | 13 | 7 | | 154 |

PLAN B -- 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 - 25 | | | | | | | | | | | | | 0 |
| 26 - 30 | | | | | | | | | | | | | 4,430 |
| 31 - 35 | | | | | | | | | | | | | 9,722 |
| 36 - 40 | 11,712 | | | | | | | | 6,785 | 11,713 | | | 5,738 |
| 41 - 45 | | | | | | | | | 8,983 | 7,239 | | | 7,332 |
| 46 - 50 | | | | | | | | | 9,709 | 4,656 | | | 8,549 |
| 51 - 55 | | | | | | | 13,079 | 8,836 | | | | | 12,853 |
| 56 - 60 | 9,330 | 45,322 | 7,207 | 12,232 | 10,185 | 14,300 | 5,107 | 13,335 | 9,709 | | | | 15,737 |
| 61 - 65 | 7,638 | 9,427 | 4,527 | 5,426 | 8,183 | 9,151 | 4,288 | 5,422 | | | | | 9,380 |
| 66 - 70 | 7,038 | 5,652 | | | | 8,021 | | | | | | | 6,957 |
| 71 - 75 | | 7,712 | | | | | | | | | | | 7,207 |
| 76 - 80 | | | | | | | | | | | | | 0 |
| 81 & Over | 499 | | | | | | | | | | | | 499 |
| Average | 7,716 | 17,156 | 6,761 | 8,829 | 9,518 | 12,871 | 11,045 | 10,650 | 8,656 | 8,417 | 5,684 | | 10,458 |

PLAN B - 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 - 55 | 7 | 3 | 2 | 4 | 1 | | | 1 | | | | 0 |
| 56 - 60 | 26 | 30 | 29 | 13 | 8 | 17 | 7 | 3 | | | | 18 |
| 61 - 65 | 26 | 25 | 19 | 23 | 17 | 69 | 17 | 5 | 1 | 1 | | 134 |
| 66 - 70 | 4 | 8 | 6 | 18 | 7 | 61 | 42 | 7 | 1 | 1 | 1 | 202 |
| 71 - 75 | 2 | 6 | 2 | 1 | 3 | 20 | 47 | 27 | 2 | 1 | | 156 |
| 76 - 80 | | | | | | 6 | 17 | 29 | 16 | 3 | 1 | 111 |
| 81 - 85 | | | 1 | 1 | | | | 3 | 10 | 12 | 1 | 74 |
| 86 - 90 | | | | | | | 3 | | 1 | 5 | 7 | 26 |
| 91 & Over | | | | | | | | | | | | 16 |
| Totals | 65 | 72 | 59 | 60 | 36 | 173 | 133 | 75 | 31 | 23 | 10 | 737 |

PLAN B - 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 - 55 | 24,633 | 28,009 | 20,567 | 27,330 | 18,769 | 19,766 | 9,369 | 4,273 | | | | 23,886 |
| 56 - 60 | 15,701 | 16,607 | 22,005 | 18,711 | 21,750 | 19,766 | 9,369 | 5,955 | | 6,270 | | 17,818 |
| 61 - 65 | 12,098 | 17,069 | 15,771 | 15,614 | 15,175 | 12,777 | 19,864 | 14,409 | 6,417 | | | 14,633 |
| 66 - 70 | 9,598 | 10,667 | 14,756 | 12,536 | 12,635 | 12,136 | 10,562 | 14,692 | 7,293 | 11,416 | 3,751 | 11,766 |
| 71 - 75 | 7,238 | 18,675 | 17,214 | 3,596 | 15,968 | 10,548 | 9,416 | 12,086 | 13,311 | 927 | | 10,989 |
| 76 - 80 | | | 8,823 | 9,362 | | 11,891 | 8,729 | 10,885 | 7,812 | 8,913 | 16,894 | 9,760 |
| 81 - 85 | | | | | | | 6,092 | 8,425 | 8,580 | 9,863 | 1,815 | 8,894 |
| 86 - 90 | | | | | | | | | 3,299 | 8,603 | 8,766 | 7,872 |
| 91 & Over | | | | | | | | | | | | |
| Average | 14,586 | 16,755 | 18,826 | 15,838 | 16,308 | 12,949 | 10,948 | 11,524 | 8,207 | 8,988 | 8,382 | 13,444 |

PLAN B - 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 - 40 | | | | | | | | | | | | | | | 0 |
| 41 - 45 | | | | | | | 1 | | | | | | | | 1 |
| 46 - 50 | | | 1 | | | 1 | | | | | | | | | 2 |
| 51 - 55 | 1 | | 1 | | | 3 | 2 | | | | | | | | 7 |
| 56 - 60 | 1 | | | 1 | 3 | 5 | | 1 | | | | | | | 11 |
| 61 - 65 | | | | | | 3 | | | | | | | | | 3 |
| 66 & Over | | | | | | | | | | | | | | | 0 |
| Totals | 2 | 0 | 2 | 1 | 3 | 12 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |

PLAN B - 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 - 40 | | | | | | | | | | | | | | | | 0 |
| 41 - 45 | | | | | | | 5,293 | | | | | | | | | 5,293 |
| 46 - 50 | | | 12,642 | | | 9,697 | | | | | | | | | | 11,170 |
| 51 - 55 | 15,080 | | 19,346 | | | 9,231 | 6,153 | | | | | | | | | 10,632 |
| 56 - 60 | 5,883 | | | 8,507 | 9,576 | 13,009 | | 5,335 | | | | | | | | 10,318 |
| 61 - 65 | | | | | | 7,026 | | | | | | | | | | 7,026 |
| 66 & Over | | | | | | | | | | | | | | | | 0 |
| Average | 10,482 | 0 | 15,994 | 8,507 | 9,576 | 10,293 | 5,866 | 5,335 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9,860 |

EXHIBIT XX
PLAN B: YEAR-TO-YEAR COMPARISON

| | Fiscal 2018 | Fiscal 2017 | Fiscal 2016 | Fiscal 2015 |
|--|----------------|----------------|----------------|----------------|
| Number of Active Members | 2,429 | 2,459 | 2,415 | 2,413 |
| Number of Retirees & Survivors | 896 | 855 | 792 | 747 |
| Number of Terminated Due Deferred Benefits | 154 | 142 | 138 | 139 |
| Number Terminated Due Refunds | 1,708 | 1,637 | 1,608 | 1,554 |
| Active Lives Payroll | \$ 105,914,905 | \$ 103,056,369 | \$ 100,932,377 | \$ 98,127,898 |
| Retiree Benefits in Payment | \$ 11,243,992 | \$ 10,430,299 | \$ 9,070,674 | \$ 8,150,177 |
| Market Value of Assets | \$ 307,800,757 | \$ 325,626,878 | \$ 275,756,021 | \$ 255,103,397 |
| Entry Age Normal (EAN) Accrued Liability | \$ 329,243,218 | \$ 307,480,656 | \$ 283,598,901 | \$ 267,985,810 |
| Ratio of AVA to EAN Accrued Liability | 99.11% | 101.09% | 100.38% | 98.46% |
| Actuarial Value of Assets | \$ 326,300,632 | \$ 310,818,392 | \$ 284,685,809 | \$ 263,849,591 |
| Present Value of Future Employer Normal Cost | \$ 83,679,498 | \$ 76,666,027 | \$ 71,874,582 | \$ 74,851,929 |
| Present Value of Future Employee Contrib. | \$ 25,843,520 | \$ 24,893,108 | \$ 24,084,343 | \$ 23,527,632 |
| Funding Deposit Account Credit Balance | \$ 6,220,583 | \$ 5,361,971 | \$ 5,602,259 | \$ 4,622,489 |
| Present Value of Future Benefits | \$ 429,603,067 | \$ 407,015,556 | \$ 375,042,475 | \$ 357,606,663 |

| | Fiscal 2019 | Fiscal 2018 | Fiscal 2017 | Fiscal 2016 |
|--|-------------|-------------|-------------|-------------|
| Employee Contribution Rate | 3.00% | 3.00% | 3.00% | 3.00% |
| Projected Tax Contribution as % of Payroll | 1.24% | 1.22% | 1.21% | 1.26% |
| Actuarially Required Net Direct Employer Contribution Rate | 7.53% | 7.01% | 6.75% | 7.20% |
| Actual Employer Contribution Rate | 7.50% | 7.50% | 8.00% | 8.00% |

| Fiscal 2014 | Fiscal 2013 | Fiscal 2012 | Fiscal 2011 | Fiscal 2010 | Fiscal 2009 |
|----------------|----------------|----------------|----------------|----------------|----------------|
| 2,321 | 2,288 | 2,298 | 2,303 | 2,313 | 2,290 |
| 714 | 688 | 657 | 611 | 576 | 560 |
| 135 | 135 | 132 | 129 | 125 | 118 |
| 1,531 | 1,550 | 1,504 | 1,471 | 1,430 | 1,426 |
| \$ 91,698,297 | \$ 89,168,260 | \$ 86,882,261 | \$ 84,237,202 | \$ 81,999,193 | \$ 79,373,895 |
| \$ 7,448,991 | \$ 6,779,114 | \$ 6,334,153 | \$ 5,746,033 | \$ 5,349,314 | \$ 4,986,096 |
| \$ 253,501,744 | \$ 237,412,166 | \$ 196,577,145 | \$ 165,603,549 | \$ 161,776,161 | \$ 134,940,283 |
| \$ 249,207,071 | \$ 233,321,224 | \$ 212,489,491 | \$ 198,962,892 | \$ 186,118,552 | \$ 171,160,473 |
| 97.50% | 92.60% | 87.62% | 87.13% | 87.62% | 87.90% |
| \$ 242,977,968 | \$ 216,066,754 | \$ 186,172,779 | \$ 173,354,490 | \$ 163,075,793 | \$ 150,446,497 |
| \$ 61,503,111 | \$ 71,374,679 | \$ 74,251,290 | \$ 71,951,379 | \$ 67,556,191 | \$ 60,488,525 |
| \$ 19,608,454 | \$ 19,192,399 | \$ 18,544,210 | \$ 18,084,026 | \$ 17,527,008 | \$ 16,221,775 |
| \$ 2,281,164 | \$ 2,126,959 | \$ 1,559,909 | \$ 1,012,867 | \$ 334,656 | \$ 311,308 |
| \$ 321,808,369 | \$ 304,506,873 | \$ 277,408,370 | \$ 262,377,028 | \$ 247,824,336 | \$ 226,845,489 |

| Fiscal 2015 | Fiscal 2014 | Fiscal 2013 | Fiscal 2012 | Fiscal 2011 | Fiscal 2010 |
|-------------|-------------|-------------|-------------|-------------|-------------|
| 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% |
| 1.36% | 1.21% | 1.14% | 1.09% | 1.05% | 1.13% |
| 6.91% | 8.60% | 9.33% | 9.31% | 9.07% | 8.60% |
| 9.00% | 9.25% | 10.00% | 10.00% | 10.00% | 10.00% |

SUMMARY OF PRINCIPAL PLAN PROVISIONS

All members of the Parochial Employees' Retirement System are participants in either Plan A or Plan B according to the provisions of the agreement entered into by their employer. All employees of a participating employer must participate in the same plan. The principal provisions of each plan are given below. The following summary of plan provisions is for general informational purposes only and does not constitute a guarantee of benefits.

PLAN A PROVISIONS:

CONTRIBUTION RATES – The Plan A fund is financed by employee contributions at a rate determined by the Board subject to the statutory range of 8% through 11% of each member's earnings and employer contributions as determined by the Public Retirement Systems' Actuarial Committee. In addition, each sheriff and ex-officio tax collector deducts one-fourth of one percent of the aggregate amount of the tax shown to be collected by the tax roll of each respective parish, excepting Orleans Parish and East Baton Rouge Parish, and remits the money to the system on an annual basis. The system also receives revenue sharing funds each year as appropriated by the legislature. In any fiscal year in which employer contribution rate as actuarially determined is scheduled to decrease, the Board of Trustees may elect to maintain the existing rate or any rate between the existing and minimum rates.

RETIREMENT BENEFITS – Members hired on or before December 31, 2006, with seven years of creditable service may retire at age sixty-five; ten years of creditable service may retire at age sixty; members with twenty-five years of service may retire at age fifty-five; members with thirty years of service may retire regardless of age. Members hired on or after January 1, 2007, with seven years of creditable service may retire at age sixty-seven; ten years of creditable service may retire at age sixty-two; members with thirty years of service may retire at age fifty-five. The retirement allowance is equal to three percent of the member's final compensation multiplied by his years of creditable service; however, any employee who was a member of the supplemental plan only prior to the revision date has the benefit earned for service credited prior to the revision date on the basis of one percent of final compensation plus two dollars per month for each year of service credited prior to the revision date, and three percent of final compensation for each year of service credited after the revision date. All accumulated annual leave for which payment cannot be made in accordance with law and all unused sick leave accumulated at the time of retirement is included in the member's creditable service for retirement computation purposes. The retirement allowance may not exceed the greater of one hundred percent of member's final salary or final compensation. Final compensation for members hired before January 1, 2007 refers to the highest 36 months of consecutive or joined service; final compensation for members hired after December 31, 2006 refers to the highest 60 months of consecutive or joined service.

DISABILITY BENEFITS – Five years of creditable service are required in order to be eligible for disability benefits for members hired on or before December 31, 2006. Seven years of creditable service are required in order to be eligible for disability benefits for members hired on or after January 1, 2007. Disabled members receive a normal retirement allowance if eligible. Otherwise, the member receives the lesser of three percent of compensation multiplied by his years of service, not to be less than fifteen years, or the accrual percentage as defined for retirement benefits multiplied by final compensation multiplied by years of service assuming continued service to age sixty for members hired on or before December 31, 2006 or age sixty-two for members hired on or after January 1, 2007.

SURVIVOR BENEFITS – Five years of creditable service is required in order to be eligible for survivor benefits. If a member is eligible for normal retirement at the time of death, the surviving spouse receives an automatic option 2 benefit. If the member was not eligible for a normal retirement, the surviving unmarried spouse with minor children receives sixty percent of final compensation. If the member was not eligible for a normal retirement, the surviving unmarried spouse with no minor children receives forty percent of final compensation payable upon the attainment of age sixty by the spouse, or upon becoming disabled. Minor children with no unmarried spouse receive thirty percent of final compensation each, not to exceed a total of sixty percent of final compensation.

CONTRIBUTION REFUNDS – Upon withdrawal from service, members not entitled to a retirement allowance are paid a refund of accumulated contributions upon request. Receipt of such a refund cancels all accrued rights in the system. If a member receives a refund of contributions and is subsequently rehired on or after January 1, 2007, the provisions applicable to members initially hired on or after January 1, 2007 will apply.

PLAN B PROVISIONS:

CONTRIBUTION RATES – The Plan B fund is financed by employee contributions at a rate determined by the Board subject to the statutory range of 3% through 5% of each member's earnings and employer contributions as determined by the Public Retirement Systems' Actuarial Committee. In addition, each sheriff and ex officio tax collector deducts one-fourth of one percent of the aggregate amount of the tax shown to be collected by the tax roll of each respective parish excepting, Orleans Parish and East Baton Rouge Parish, and remits the money to the system on an annual basis. The system also receives revenue sharing funds each year as appropriated by the legislature. In any fiscal year in which the employer contribution rate as actuarially determined is scheduled to decrease, the Board of Trustees may elect to maintain the existing rate or any rate between the existing and minimum rates.

RETIREMENT BENEFITS: – Members hired on or before December 31, 2006, with seven years of creditable service may retire at age sixty-five; ten years of creditable service may retire at age sixty; members with thirty years of service may retire at age fifty-five. Members hired on or after January 1, 2007, with seven years of creditable service may retire at age sixty-seven; ten years of creditable service may retire at age sixty-two; members with thirty years of service may retire at age fifty-five. The retirement allowance is equal to two percent of the member's final compensation multiplied by the years of creditable service. All accumulated annual leave for which payment cannot be made in accordance with law and all unused sick leave accumulated at the time of retirement is included in the member's creditable service for retirement computation purposes. Final compensation for members hired before January 1, 2007 refers to the highest 36 months of consecutive or joined service; final compensation for members hired after December 31, 2006 refers to the highest 60 months of consecutive or joined service.

DISABILITY BENEFITS – Five years of creditable service is required in order to be eligible for disability benefits for members hired on or before December 31, 2006. Seven years of creditable service is required in order to be eligible for disability benefits for members hired on or after January 1, 2007. Disabled members receive a normal retirement allowance, if eligible. Otherwise, the member receives the lesser of two percent of compensation multiplied by the years of service, not to be less

than fifteen years, or two percent of final compensation multiplied by the years of service assuming continued service to age sixty for members hired on or before December 31, 2006 or age sixty-two for members hired on or after January 1, 2007.

SURVIVOR BENEFITS – The surviving spouse of a member who was eligible for normal retirement at the time of death receives an automatic option 2 benefit. The surviving spouse of a member with ten or more years of creditable service and not eligible for normal retirement at the time of death receives an option 2 benefit payable at attainment of age fifty by the spouse.

CONTRIBUTION REFUNDS – Upon withdrawal from service, members not entitled to a retirement allowance are paid a refund of accumulated contributions upon request. Receipt of such a refund cancels all accrued rights in the system. If a member receives a refund of contributions and is subsequently rehired on or after January 1, 2007, the provisions applicable to members initially hired on or after January 1, 2007 will apply.

PROVISIONS APPLICABLE TO BOTH PLAN A AND B:

OPTIONAL ALLOWANCES – Upon application for retirement any member may elect to receive their benefit in a retirement allowance payable throughout their life, or he may elect at that time to receive the actuarial equivalent of their retirement allowance in a reduced retirement allowance payable throughout life. A retiree cannot change the designation of beneficiary.

Option 2 – Upon retirement, the member receives a reduced benefit. Upon the member's death, the surviving spouse will continue to receive the same reduced benefit.

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

Option 4 – Upon retirement, the member may elect to receive a Board-approved benefit that is actuarially equivalent to the maximum benefit.

DEFERRED RETIREMENT OPTION PLAN:

In lieu of terminating employment and accepting a service retirement allowance, any member of Plan A or Plan B who is eligible for a normal retirement may elect to participate in the Deferred Retirement Option Plan (DROP) for up to three years and defer the receipt of benefits. In terms of DROP eligibility, any member whose service, when combined with service in any other state or statewide public retirement system exceeds thirty years will be eligible to include reciprocally recognized service credit. Upon commencement of participation in the plan, employer contributions are payable but employee contributions cease. The monthly retirement benefits that would have been payable, had the person elected to cease employment and receive a service retirement allowance, are paid into the DROP fund. This fund does earn interest once the member terminates participation in DROP but continues their employment. The interest rate is based upon the rate of return of a short-term U.S. Treasury security, a group of short-term U.S. Treasury Securities, or an index of short-term U.S. Treasury securities to be selected by the board of trustees. This interest is to be credited to the individual's account balance on an annual basis. Additionally, no cost-of-living increases are payable to the participants until employment which made them eligible to become members of the system has been terminated for at least one full year.

Upon termination of employment prior to, or at the end of, the specified period of participation, a participant in the plan may receive, at his option, a lump sum from the account equal to the payments into the account, a true annuity based upon his account balance in that fund, or any other method of payment if approved by the board of trustees. The monthly benefits that were being paid into the Deferred Retirement Option Plan fund will begin to be paid to the retiree. If a participant dies during the participation in the plan, a lump sum equal to his account balance in the plan fund shall be paid to his named beneficiary or, if none, to his estate. If employment is not terminated at the end of the three years, payments into the plan fund cease and the person resumes active contributing membership in the system. Additional accrued benefits are based on final average compensation used to calculate the member's original benefit unless the additional period of service is at least thirty-six months for those individuals hired on or before December 31, 2006; or at least sixty months for those individuals hired on or after January 1, 2007.

COST OF LIVING INCREASES – The Board of Trustees is authorized to grant retired members, and widows of members, who have been retired for at least one full year an annual cost of living increase of two percent of their original benefit and all retired members and widows who are sixty-five years of age and older a two percent increase in their original benefit (or their benefit as of October 1, 1977, if they retired prior to that time). 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 on investments. In lieu of other cost of living increases the Board may grant an increase to retirees in the form "X×(A&B)" where "A" is equal to the number of years of credited service accrued as retirement or death of the member or retiree and "B" is equal to the number of years since death of the member or retiree to June 30 of the initial year of increase and "X" is equal to any amount available for funding such increase up to a maximum of \$1.00.

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.

| <u>Factor</u> | <u>Increase in Factor Results in</u> |
|--------------------------------|--------------------------------------|
| 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 |

The following assumptions apply to both Plan A and Plan B unless stated otherwise.

ACTUARIAL COST METHOD: Plan A: The Aggregate Actuarial Cost Method with allocation based on earnings. The normal cost is interest adjusted for midyear payment.

Plan B: The Aggregate Actuarial Cost Method with allocation based on earnings. The normal cost is interest adjusted for midyear payment.

ACTUARIAL ASSET VALUES: 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.

VALUATION INTEREST RATE: 6.50%

ANNUAL SALARY INCREASE RATE: 4.75% (2.35% Merit / 2.40% Inflation) for Plan A
4.25% (1.85% Merit / 2.40% Inflation) for Plan B

ACTIVE MEMBER MORTALITY: Pub-2010 Public Retirement Plans Mortality Table for General Employees multiplied by 130% for males and 125% for females, each with full generational projection using the MP2018 scale.

ANNUITANT AND
BENEFICIARY MORTALITY

Pub-2010 Public Retirement Plans Mortality Table for General Healthy Retirees multiplied by 130% for males and 125% for females, each with full generational projection using the MP2018 scale

DISABLED LIVES MORTALITY:

Pub-2010 Public Retirement Plans Mortality Table for General Disabled Retirees multiplied by 130% for males and 125% for females, each with full generational projection using the MP2018 scale

RETIREE COST OF LIVING INCREASE:

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.

RATES OF RETIREMENT:

The table of these rates is included later in the report. All eligible persons age 85 and over in both plans are assumed to retire immediately. These rates apply only to those individuals eligible to retire.

RATES OF WITHDRAWAL:

The rates of withdrawal are applied based upon completed years of service:

PLAN A:

| <u>Service</u> | | <u>Service</u> | |
|-------------------|---------------|-------------------|---------------|
| <u>Duration ≤</u> | <u>Factor</u> | <u>Duration ≤</u> | <u>Factor</u> |
| 1 | 0.21 | 17 | 0.02 |
| 2 | 0.18 | 18 | 0.02 |
| 3 | 0.16 | 19 | 0.02 |
| 4 | 0.13 | 20 | 0.02 |
| 5 | 0.11 | 21 | 0.01 |
| 6 | 0.09 | 22 | 0.01 |
| 7 | 0.08 | 23 | 0.01 |
| 8 | 0.07 | 24 | 0.02 |
| 9 | 0.06 | 25 | 0.02 |
| 10 | 0.05 | 26 | 0.02 |
| 11 | 0.04 | 27 | 0.01 |
| 12 | 0.04 | 28 | 0.01 |
| 13 | 0.04 | 29 | 0.00 |
| 14 | 0.03 | 30 | 0.00 |
| 15 | 0.03 | >30 | 0.00 |
| 16 | 0.03 | | |

| PLAN B | <u>Service</u> | | <u>Service</u> | |
|--------|-------------------|---------------|-------------------|---------------|
| | <u>Duration ≤</u> | <u>Factor</u> | <u>Duration ≤</u> | <u>Factor</u> |
| | 1 | 0.21 | 17 | 0.02 |
| | 2 | 0.18 | 18 | 0.02 |
| | 3 | 0.15 | 19 | 0.01 |
| | 4 | 0.13 | 20 | 0.01 |
| | 5 | 0.10 | 21 | 0.01 |
| | 6 | 0.08 | 22 | 0.01 |
| | 7 | 0.07 | 23 | 0.01 |
| | 8 | 0.06 | 24 | 0.01 |
| | 9 | 0.05 | 25 | 0.02 |
| | 10 | 0.05 | 26 | 0.02 |
| | 11 | 0.04 | 27 | 0.02 |
| | 12 | 0.04 | 28 | 0.02 |
| | 13 | 0.04 | 29 | 0.01 |
| | 14 | 0.03 | 30 | 0.00 |
| | 15 | 0.03 | >30 | 0.00 |
| | 16 | 0.02 | | |

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.

FAMILY STATISTICS: Assumptions used in determining the cost of various survivor benefits are listed below:

| <u>Age at</u> | <u>% with</u> | <u># of</u> | <u>Average</u> |
|---------------|-----------------|-----------------|----------------|
| <u>Death</u> | <u>Children</u> | <u>Children</u> | <u>Age</u> |
| 25 | 70% | 1.84 | 5 |
| 35 | 86% | 2.13 | 9 |
| 45 | 75% | 1.70 | 12 |
| 55 | 22% | 1.42 | 14 |
| 65 | 4% | 1.45 | 15 |

VESTING ELECTING PERCENTAGE: The percent of those who are vested at termination and elect deferred benefits in lieu of contribution refunds are as follows:

| | | |
|---------|---------------|-----|
| Plan A: | Under Age 40: | 30% |
| | Age 40 – 49: | 45% |
| | Above Age 49: | 60% |
| Plan B: | Under Age 40: | 45% |
| | Age 40 – 49: | 45% |
| | Above Age 49: | 55% |

| | |
|---|---|
| SICK AND ANNUAL LEAVE: (Tier 1 members) | Retirees were assumed to convert 1.44 months for Plan A and 0.6 months for Plan B of sick and annual leave to retirement credit for each ten years of service credit. |
| RATES OF DROP ENTRY: | The table of these rates is included later in the report. These rates apply only to those individuals eligible to enter the DROP plan. |
| DROP PARTICIPATION: | All members who enter the DROP plan are assumed to participate for the full 3 year period and 50% are assumed to retire at the end of DROP participation with 50% assumed to work 2 years post DROP and then retire. |
| DISABILITY RATES: | 40% of the disability rates used for the 21st valuation of the Railroad Retirement System for individuals with 10-19 years of service for Plan A. 40% of the disability rates used for the 21st valuation of the Railroad Retirement System for individuals with 10-19 years of service for Plan B. A table of these rates is included later in the report. |
| RETIREMENT RATES FOR ACTIVE FORMER DROP PARTICIPANTS | The table of these rates is included later in the report. All eligible persons age 85 and over in both plans are assumed to retire immediately. These rates only apply to members who return to work after completing the DROP plan and then subsequently retire. |

ACTUARIAL TABLES AND RATES – PLAN A

| Age | Remarriage Rates | Tier 1 Retirement Rates | Tier 2 Retirement Rates | Tier 1 DROP Entry Rates | Tier 2 DROP Entry Rates | Post-DROP Retirement Rates | Disability Rates |
|-----|------------------|-------------------------|-------------------------|-------------------------|-------------------------|----------------------------|------------------|
| 18 | 0.06124 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 19 | 0.06124 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 20 | 0.06124 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 21 | 0.05818 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 22 | 0.05524 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 23 | 0.05242 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 24 | 0.04971 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 25 | 0.04566 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 26 | 0.04335 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 27 | 0.04114 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 28 | 0.03902 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 29 | 0.03698 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 30 | 0.03502 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 31 | 0.03314 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 32 | 0.03134 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 33 | 0.02961 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 34 | 0.02795 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 35 | 0.02636 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00068 |
| 36 | 0.02483 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00076 |
| 37 | 0.02336 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00084 |
| 38 | 0.02195 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00096 |
| 39 | 0.02060 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00108 |
| 40 | 0.01930 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00124 |
| 41 | 0.01805 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00140 |
| 42 | 0.01686 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00156 |
| 43 | 0.01571 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00176 |
| 44 | 0.01461 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00200 |
| 45 | 0.01355 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00228 |
| 46 | 0.01253 | 0.09000 | 0.00000 | 0.27000 | 0.00000 | 0.38000 | 0.00260 |
| 47 | 0.01156 | 0.09000 | 0.00000 | 0.27000 | 0.00000 | 0.38000 | 0.00292 |
| 48 | 0.01063 | 0.09000 | 0.00000 | 0.27000 | 0.00000 | 0.38000 | 0.00332 |
| 49 | 0.00973 | 0.08000 | 0.00000 | 0.45000 | 0.00000 | 0.38000 | 0.00376 |
| 50 | 0.00887 | 0.07000 | 0.00000 | 0.47000 | 0.00000 | 0.38000 | 0.00428 |
| 51 | 0.00804 | 0.06000 | 0.00000 | 0.43000 | 0.00000 | 0.38000 | 0.00488 |
| 52 | 0.00725 | 0.08000 | 0.00000 | 0.42000 | 0.00000 | 0.38000 | 0.00552 |
| 53 | 0.00649 | 0.10000 | 0.00000 | 0.44000 | 0.00000 | 0.38000 | 0.00628 |
| 54 | 0.00576 | 0.12000 | 0.00000 | 0.41000 | 0.00000 | 0.38000 | 0.00712 |
| 55 | 0.00000 | 0.12000 | 0.12000 | 0.35000 | 0.35000 | 0.36000 | 0.00808 |
| 56 | 0.00000 | 0.10000 | 0.10000 | 0.28000 | 0.28000 | 0.33000 | 0.00920 |
| 57 | 0.00000 | 0.09000 | 0.09000 | 0.23000 | 0.23000 | 0.32000 | 0.01044 |
| 58 | 0.00000 | 0.08000 | 0.08000 | 0.19000 | 0.19000 | 0.32000 | 0.01184 |
| 59 | 0.00000 | 0.08000 | 0.08000 | 0.18000 | 0.18000 | 0.32000 | 0.01348 |
| 60 | 0.00000 | 0.08000 | 0.08000 | 0.17000 | 0.17000 | 0.31000 | 0.01952 |
| 61 | 0.00000 | 0.08000 | 0.08000 | 0.17000 | 0.17000 | 0.28000 | 0.01952 |
| 62 | 0.00000 | 0.08000 | 0.08000 | 0.16000 | 0.16000 | 0.25000 | 0.01952 |
| 63 | 0.00000 | 0.09000 | 0.09000 | 0.15000 | 0.15000 | 0.25000 | 0.01952 |
| 64 | 0.00000 | 0.11000 | 0.11000 | 0.14000 | 0.14000 | 0.26000 | 0.01952 |
| 65 | 0.00000 | 0.13000 | 0.14000 | 0.12000 | 0.12000 | 0.28000 | 0.01952 |
| 66 | 0.00000 | 0.15000 | 0.16000 | 0.10000 | 0.10000 | 0.27000 | 0.01952 |
| 67 | 0.00000 | 0.14000 | 0.15000 | 0.08000 | 0.08000 | 0.25000 | 0.01952 |
| 68 | 0.00000 | 0.13000 | 0.14000 | 0.08000 | 0.08000 | 0.23000 | 0.01952 |
| 69 | 0.00000 | 0.12000 | 0.13000 | 0.10000 | 0.09000 | 0.21000 | 0.01952 |
| 70 | 0.00000 | 0.12000 | 0.12000 | 0.12000 | 0.10000 | 0.22000 | 0.01952 |
| 71 | 0.00000 | 0.10000 | 0.11000 | 0.11000 | 0.11000 | 0.23000 | 0.01952 |
| 72 | 0.00000 | 0.08000 | 0.10000 | 0.10000 | 0.10000 | 0.22000 | 0.01952 |
| 73 | 0.00000 | 0.08000 | 0.11000 | 0.09000 | 0.09000 | 0.17000 | 0.01952 |
| 74 | 0.00000 | 0.10000 | 0.12000 | 0.07000 | 0.08000 | 0.13000 | 0.01952 |
| 75 | 0.00000 | 0.13000 | 0.14000 | 0.06000 | 0.06000 | 0.13000 | 0.01952 |

ACTUARIAL TABLES AND RATES – PLAN B

| | Remarriage Rates | Tier 1 Retirement Rates | Tier 2 Retirement Rates | Tier 1 DROP Entry Rates | Tier 2 DROP Entry Rates | Post-DROP Retirement Rates | Plan B Disability Rates |
|----|-----------------------------|--|--|--|--|---|--|
| 18 | 0.06124 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 19 | 0.06124 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 20 | 0.06124 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 21 | 0.05818 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 22 | 0.05524 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 23 | 0.05242 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 24 | 0.04971 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 25 | 0.04566 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 26 | 0.04335 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 27 | 0.04114 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 28 | 0.03902 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 29 | 0.03698 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 30 | 0.03502 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 31 | 0.03314 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 32 | 0.03134 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 33 | 0.02961 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 34 | 0.02795 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00060 |
| 35 | 0.02636 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00068 |
| 36 | 0.02483 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00076 |
| 37 | 0.02336 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00084 |
| 38 | 0.02195 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00096 |
| 39 | 0.02060 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00108 |
| 40 | 0.01930 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00124 |
| 41 | 0.01805 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00140 |
| 42 | 0.01686 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00156 |
| 43 | 0.01571 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00176 |
| 44 | 0.01461 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00200 |
| 45 | 0.01355 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00228 |
| 46 | 0.01253 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00260 |
| 47 | 0.01156 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00292 |
| 48 | 0.01063 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00332 |
| 49 | 0.00973 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00376 |
| 50 | 0.00887 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00428 |
| 51 | 0.00804 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00488 |
| 52 | 0.00725 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00552 |
| 53 | 0.00649 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00628 |
| 54 | 0.00576 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00712 |
| 55 | 0.00000 | 0.08000 | 0.08000 | 0.31000 | 0.31000 | 0.02000 | 0.00808 |
| 56 | 0.00000 | 0.09000 | 0.09000 | 0.31000 | 0.31000 | 0.02000 | 0.00920 |
| 57 | 0.00000 | 0.09000 | 0.09000 | 0.27000 | 0.27000 | 0.02000 | 0.01044 |
| 58 | 0.00000 | 0.07000 | 0.07000 | 0.25000 | 0.25000 | 0.12000 | 0.01184 |
| 59 | 0.00000 | 0.06000 | 0.06000 | 0.23000 | 0.23000 | 0.24000 | 0.01348 |
| 60 | 0.00000 | 0.07000 | 0.07000 | 0.20000 | 0.20000 | 0.31000 | 0.01952 |
| 61 | 0.00000 | 0.09000 | 0.09000 | 0.15000 | 0.15000 | 0.33000 | 0.01952 |
| 62 | 0.00000 | 0.10000 | 0.11000 | 0.11000 | 0.11000 | 0.31000 | 0.01952 |
| 63 | 0.00000 | 0.10000 | 0.11000 | 0.10000 | 0.09000 | 0.26000 | 0.01952 |
| 64 | 0.00000 | 0.11000 | 0.13000 | 0.10000 | 0.09000 | 0.22000 | 0.01952 |
| 65 | 0.00000 | 0.15000 | 0.16000 | 0.09000 | 0.09000 | 0.20000 | 0.01952 |
| 66 | 0.00000 | 0.19000 | 0.18000 | 0.07000 | 0.07000 | 0.19000 | 0.01952 |
| 67 | 0.00000 | 0.20000 | 0.19000 | 0.04000 | 0.05000 | 0.20000 | 0.01952 |
| 68 | 0.00000 | 0.17000 | 0.17000 | 0.03000 | 0.04000 | 0.17000 | 0.01952 |
| 69 | 0.00000 | 0.13000 | 0.15000 | 0.03000 | 0.04000 | 0.14000 | 0.01952 |
| 70 | 0.00000 | 0.10000 | 0.15000 | 0.04000 | 0.05000 | 0.17000 | 0.01952 |
| 71 | 0.00000 | 0.10000 | 0.15000 | 0.04000 | 0.07000 | 0.25000 | 0.01952 |
| 72 | 0.00000 | 0.12000 | 0.15000 | 0.05000 | 0.08000 | 0.31000 | 0.01952 |
| 73 | 0.00000 | 0.15000 | 0.16000 | 0.04000 | 0.08000 | 0.29000 | 0.01952 |
| 74 | 0.00000 | 0.19000 | 0.16000 | 0.02000 | 0.05000 | 0.22000 | 0.01952 |
| 75 | 0.00000 | 0.21000 | 0.17000 | 0.01000 | 0.01000 | 0.21000 | 0.01952 |

PRIOR YEAR ASSUMPTIONS

| | |
|-------------------------------------|--|
| VALUATION INTEREST RATE: | 6.75% |
| ANNUAL SALARY INCREASE RATE: | 5.25% (2.75% Merit /2.50% Inflation) for Plan A & B |
| ACTIVE MEMBER MORTALITY: | RP-2000 Employee Table set back 4 years for males and set back 3 years for females |
| ANNUITANT AND BENEFICIARY MORTALITY | RP-2000 Healthy Annuitant table set forward 2 years and projected to 2031 using scale AA for males and RP-2000 Healthy Annuitant table set forward 1 year and projected to 2031 using scale AA for females. |
| RETIREE COST OF LIVING INCREASE: | 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. |
| RATES OF RETIREMENT: | The table of these rates is included later in the report. All eligible persons age 80 and over in both plans are assumed to retire immediately. These rates apply only to those individuals eligible to retire. |
| RATES OF WITHDRAWAL: | The rates of withdrawal are applied based upon completed years of service: |

| PLAN A: | Service | Factor | Service | Factor |
|---------|---------|--------|---------|--------|
| | <1 | 0.25 | 11 | 0.04 |
| | 1 | 0.21 | 12 | 0.03 |
| | 2 | 0.15 | 13 | 0.03 |
| | 3 | 0.12 | 14 | 0.02 |
| | 4 | 0.10 | 15 | 0.02 |
| | 5 | 0.09 | 16 | 0.02 |
| | 6 | 0.08 | 17 | 0.02 |
| | 7 | 0.07 | 18 | 0.02 |
| | 8 | 0.06 | 19 | 0.02 |
| | 9 | 0.05 | 20 | 0.02 |
| | 10 | 0.04 | >20 | 0.01 |
| PLAN B: | Service | Factor | Service | Factor |
| | <1 | 0.23 | 11 | 0.04 |
| | 1 | 0.18 | 12 | 0.04 |
| | 2 | 0.16 | 13 | 0.04 |
| | 3 | 0.14 | 14 | 0.04 |
| | 4 | 0.10 | 15 | 0.03 |
| | 5 | 0.09 | 16 | 0.03 |
| | 6 | 0.07 | 17 | 0.03 |

| | | | |
|----|------|-----|------|
| 7 | 0.06 | 18 | 0.02 |
| 8 | 0.05 | 19 | 0.02 |
| 9 | 0.05 | 20 | 0.02 |
| 10 | 0.04 | >20 | 0.01 |

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

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

VESTING ELECTING PERCENTAGE: The percent of those who are vested at termination and elect deferred benefits in lieu of contribution refunds are as follows:

| | | |
|---------|---------------|-----|
| Plan A: | Under Age 40: | 35% |
| | Age 40 – 49: | 45% |
| | Above Age 49: | 60% |
| Plan B: | Under Age 40: | 45% |
| | Age 40 – 49: | 50% |
| | Above Age 49: | 65% |

SICK AND ANNUAL LEAVE: Retirees were assumed to convert 1.2 months of sick and annual leave to retirement credit for each ten (Tier 1 members) years of service credit for Plan A & B.

RATES OF DROP ENTRY: The table of these rates is included later in the report. These rates apply only to those individuals eligible to enter the DROP plan.

DROP PARTICIPATION PERIOD: All DROP participants are assumed to participate for 3 years and to retire at the end of their DROP participation period.

DISABILITY RATES: 50% of the disability rates used for the 21st valuation of the Railroad Retirement System for individuals with 10-19 years of service for Plan A. 40% of the disability rates used for the 21st valuation of the Railroad Retirement System for individuals with 10-19 years of service for Plan B. A table of these rates is included later in the report.

RETIREMENT RATES FOR ACTIVE FORMER DROP PARTICIPANTS: Retirement rates for active former DROP participants are 24% for Plan A and Plan B provided the member is below age 80. For members age 80 or over, the retirement rate is set at 100%.

ACTUARIAL TABLES AND RATES – PRIOR YEAR ASSUMPTIONS

| Age | Male | Female | Male | Female | Male | Female |
|-----|--------------------------------|--------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------------------------|
| | Employee Mortality Rates | Employee Mortality Rates | Retired Mortality Rates | Retired Mortality Rates | Disabled Mortality Rates | Disabled Mortality Rates |
| 18 | 0.00025 | 0.00017 | 0.00019 | 0.00012 | 0.02257 | 0.00745 |
| 19 | 0.00027 | 0.00018 | 0.00020 | 0.00012 | 0.02257 | 0.00745 |
| 20 | 0.00028 | 0.00018 | 0.00020 | 0.00012 | 0.02257 | 0.00745 |
| 21 | 0.00030 | 0.00019 | 0.00021 | 0.00011 | 0.02257 | 0.00745 |
| 22 | 0.00032 | 0.00019 | 0.00022 | 0.00012 | 0.02257 | 0.00745 |
| 23 | 0.00033 | 0.00019 | 0.00024 | 0.00012 | 0.02257 | 0.00745 |
| 24 | 0.00035 | 0.00019 | 0.00025 | 0.00013 | 0.02257 | 0.00745 |
| 25 | 0.00036 | 0.00019 | 0.00028 | 0.00014 | 0.02257 | 0.00745 |
| 26 | 0.00037 | 0.00020 | 0.00033 | 0.00015 | 0.02257 | 0.00745 |
| 27 | 0.00037 | 0.00020 | 0.00035 | 0.00016 | 0.02257 | 0.00745 |
| 28 | 0.00038 | 0.00021 | 0.00038 | 0.00017 | 0.02257 | 0.00745 |
| 29 | 0.00038 | 0.00021 | 0.00043 | 0.00018 | 0.02257 | 0.00745 |
| 30 | 0.00038 | 0.00022 | 0.00048 | 0.00022 | 0.02257 | 0.00745 |
| 31 | 0.00038 | 0.00024 | 0.00054 | 0.00027 | 0.02257 | 0.00745 |
| 32 | 0.00039 | 0.00025 | 0.00060 | 0.00031 | 0.02257 | 0.00745 |
| 33 | 0.00041 | 0.00026 | 0.00066 | 0.00033 | 0.02257 | 0.00745 |
| 34 | 0.00044 | 0.00031 | 0.00072 | 0.00035 | 0.02257 | 0.00745 |
| 35 | 0.00050 | 0.00035 | 0.00077 | 0.00036 | 0.02257 | 0.00745 |
| 36 | 0.00056 | 0.00039 | 0.00083 | 0.00038 | 0.02257 | 0.00745 |
| 37 | 0.00063 | 0.00044 | 0.00087 | 0.00040 | 0.02257 | 0.00745 |
| 38 | 0.00070 | 0.00047 | 0.00090 | 0.00042 | 0.02257 | 0.00745 |
| 39 | 0.00077 | 0.00051 | 0.00092 | 0.00044 | 0.02257 | 0.00745 |
| 40 | 0.00084 | 0.00055 | 0.00095 | 0.00048 | 0.02257 | 0.00745 |
| 41 | 0.00090 | 0.00060 | 0.00098 | 0.00053 | 0.02257 | 0.00745 |
| 42 | 0.00096 | 0.00065 | 0.00102 | 0.00059 | 0.02257 | 0.00745 |
| 43 | 0.00102 | 0.00071 | 0.00107 | 0.00064 | 0.02257 | 0.00745 |
| 44 | 0.00108 | 0.00077 | 0.00111 | 0.00070 | 0.02257 | 0.00745 |
| 45 | 0.00114 | 0.00085 | 0.00116 | 0.00074 | 0.02257 | 0.00745 |
| 46 | 0.00122 | 0.00094 | 0.00120 | 0.00078 | 0.02257 | 0.00745 |
| 47 | 0.00130 | 0.00103 | 0.00125 | 0.00082 | 0.02257 | 0.00745 |
| 48 | 0.00140 | 0.00112 | 0.00324 | 0.00088 | 0.02257 | 0.00745 |
| 49 | 0.00151 | 0.00122 | 0.00325 | 0.00133 | 0.02257 | 0.00818 |
| 50 | 0.00162 | 0.00133 | 0.00321 | 0.00145 | 0.02257 | 0.00896 |
| 51 | 0.00173 | 0.00143 | 0.00316 | 0.00161 | 0.02385 | 0.00978 |
| 52 | 0.00186 | 0.00155 | 0.00310 | 0.00187 | 0.02512 | 0.01063 |
| 53 | 0.00200 | 0.00168 | 0.00316 | 0.00219 | 0.02640 | 0.01154 |
| 54 | 0.00214 | 0.00181 | 0.00327 | 0.00259 | 0.02769 | 0.01248 |
| 55 | 0.00229 | 0.00197 | 0.00356 | 0.00306 | 0.02897 | 0.01346 |
| 56 | 0.00245 | 0.00213 | 0.00393 | 0.00364 | 0.03027 | 0.01446 |
| 57 | 0.00262 | 0.00232 | 0.00440 | 0.00421 | 0.03156 | 0.01550 |
| 58 | 0.00281 | 0.00253 | 0.00497 | 0.00473 | 0.03286 | 0.01654 |
| 59 | 0.00303 | 0.00276 | 0.00546 | 0.00531 | 0.03415 | 0.01760 |
| 60 | 0.00331 | 0.00301 | 0.00601 | 0.00592 | 0.03544 | 0.01865 |
| 61 | 0.00363 | 0.00329 | 0.00685 | 0.00658 | 0.03673 | 0.01971 |
| 62 | 0.00400 | 0.00360 | 0.00758 | 0.00728 | 0.03803 | 0.02077 |
| 63 | 0.00441 | 0.00393 | 0.00867 | 0.00804 | 0.03933 | 0.02184 |
| 64 | 0.00488 | 0.00429 | 0.00960 | 0.00887 | 0.04067 | 0.02294 |
| 65 | 0.00538 | 0.00466 | 0.01063 | 0.00977 | 0.04204 | 0.02408 |
| 66 | 0.00592 | 0.00504 | 0.01213 | 0.01074 | 0.04347 | 0.02529 |
| 67 | 0.00647 | 0.00543 | 0.01340 | 0.01179 | 0.04498 | 0.02660 |
| 68 | 0.00703 | 0.00582 | 0.01434 | 0.01297 | 0.04658 | 0.02803 |
| 69 | 0.00757 | 0.00621 | 0.01587 | 0.01433 | 0.04831 | 0.02959 |
| 70 | 0.00810 | 0.00658 | 0.01708 | 0.01591 | 0.05017 | 0.03132 |
| 71 | 0.00860 | 0.00695 | 0.01902 | 0.01715 | 0.05221 | 0.03323 |
| 72 | 0.00907 | 0.00729 | 0.02122 | 0.01906 | 0.05445 | 0.03533 |
| 73 | 0.00951 | 0.00761 | 0.02368 | 0.02048 | 0.05691 | 0.03764 |
| 74 | 0.00992 | 0.01858 | 0.02639 | 0.02261 | 0.05961 | 0.04014 |
| 75 | 0.02457 | 0.02067 | 0.03030 | 0.02414 | 0.06258 | 0.04285 |

ACTUARIAL TABLES AND RATES – PRIOR YEAR ASSUMPTIONS

| | Plan A Tier 1 Retirement Rates | Plan A Tier 2 Retirement Rates | Plan A Tier 1 DROP Entry Rates | Plan A Tier 2 DROP Entry Rates | Plan A Disability Rates | Plan B Retirement Rates | Plan B DROP Entry Rates | Plan B Disability Rates |
|----|---|---|---|---|--|--|--|--|
| 18 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 19 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 20 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 21 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 22 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 23 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 24 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 25 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 26 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 27 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 28 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 29 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 30 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 31 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 32 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 33 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 34 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00075 | 0.00000 | 0.00000 | 0.00060 |
| 35 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00085 | 0.00000 | 0.00000 | 0.00068 |
| 36 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00095 | 0.00000 | 0.00000 | 0.00076 |
| 37 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00105 | 0.00000 | 0.00000 | 0.00084 |
| 38 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00120 | 0.00000 | 0.00000 | 0.00096 |
| 39 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00135 | 0.00000 | 0.00000 | 0.00108 |
| 40 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00155 | 0.00000 | 0.00000 | 0.00124 |
| 41 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00175 | 0.00000 | 0.00000 | 0.00140 |
| 42 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00195 | 0.00000 | 0.00000 | 0.00156 |
| 43 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00220 | 0.00000 | 0.00000 | 0.00176 |
| 44 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00250 | 0.00000 | 0.00000 | 0.00200 |
| 45 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00285 | 0.00000 | 0.00000 | 0.00228 |
| 46 | 0.15000 | 0.00000 | 0.50000 | 0.00000 | 0.00325 | 0.00000 | 0.00000 | 0.00260 |
| 47 | 0.15000 | 0.00000 | 0.50000 | 0.00000 | 0.00365 | 0.00000 | 0.00000 | 0.00292 |
| 48 | 0.15000 | 0.00000 | 0.50000 | 0.00000 | 0.00415 | 0.00000 | 0.00000 | 0.00332 |
| 49 | 0.15000 | 0.00000 | 0.50000 | 0.00000 | 0.00470 | 0.00000 | 0.00000 | 0.00376 |
| 50 | 0.15000 | 0.00000 | 0.50000 | 0.00000 | 0.00535 | 0.00000 | 0.00000 | 0.00428 |
| 51 | 0.15000 | 0.00000 | 0.50000 | 0.00000 | 0.00610 | 0.00000 | 0.00000 | 0.00488 |
| 52 | 0.15000 | 0.00000 | 0.50000 | 0.00000 | 0.00690 | 0.00000 | 0.00000 | 0.00552 |
| 53 | 0.15000 | 0.00000 | 0.50000 | 0.00000 | 0.00785 | 0.00000 | 0.00000 | 0.00628 |
| 54 | 0.15000 | 0.00000 | 0.50000 | 0.00000 | 0.00890 | 0.00000 | 0.00000 | 0.00712 |
| 55 | 0.15000 | 0.15000 | 0.35000 | 0.35000 | 0.01010 | 0.15000 | 0.50000 | 0.00808 |
| 56 | 0.11000 | 0.11000 | 0.27000 | 0.27000 | 0.01150 | 0.15000 | 0.40000 | 0.00920 |
| 57 | 0.11000 | 0.11000 | 0.27000 | 0.27000 | 0.01305 | 0.15000 | 0.25000 | 0.01044 |
| 58 | 0.11000 | 0.11000 | 0.27000 | 0.27000 | 0.01480 | 0.15000 | 0.25000 | 0.01184 |
| 59 | 0.11000 | 0.11000 | 0.27000 | 0.27000 | 0.01685 | 0.15000 | 0.15000 | 0.01348 |
| 60 | 0.11000 | 0.11000 | 0.22000 | 0.22000 | 0.02440 | 0.12000 | 0.15000 | 0.01952 |
| 61 | 0.11000 | 0.11000 | 0.16000 | 0.16000 | 0.02440 | 0.12000 | 0.11000 | 0.01952 |
| 62 | 0.11000 | 0.11000 | 0.16000 | 0.16000 | 0.02440 | 0.12000 | 0.11000 | 0.01952 |
| 63 | 0.11000 | 0.11000 | 0.16000 | 0.16000 | 0.02440 | 0.12000 | 0.11000 | 0.01952 |
| 64 | 0.11000 | 0.11000 | 0.16000 | 0.16000 | 0.02440 | 0.12000 | 0.11000 | 0.01952 |
| 65 | 0.14000 | 0.14000 | 0.16000 | 0.16000 | 0.02440 | 0.20000 | 0.11000 | 0.01952 |
| 66 | 0.14000 | 0.14000 | 0.16000 | 0.16000 | 0.02440 | 0.20000 | 0.05000 | 0.01952 |
| 67 | 0.14000 | 0.14000 | 0.16000 | 0.16000 | 0.02440 | 0.12000 | 0.05000 | 0.01952 |
| 68 | 0.14000 | 0.14000 | 0.16000 | 0.16000 | 0.02440 | 0.12000 | 0.05000 | 0.01952 |
| 69 | 0.14000 | 0.14000 | 0.16000 | 0.16000 | 0.02440 | 0.12000 | 0.05000 | 0.01952 |
| 70 | 0.14000 | 0.14000 | 0.16000 | 0.16000 | 0.02440 | 0.12000 | 0.05000 | 0.01952 |
| 71 | 0.14000 | 0.14000 | 0.08000 | 0.08000 | 0.02440 | 0.12000 | 0.05000 | 0.01952 |
| 72 | 0.14000 | 0.14000 | 0.08000 | 0.08000 | 0.02440 | 0.12000 | 0.05000 | 0.01952 |
| 73 | 0.14000 | 0.14000 | 0.08000 | 0.08000 | 0.02440 | 0.12000 | 0.05000 | 0.01952 |
| 74 | 0.14000 | 0.14000 | 0.08000 | 0.08000 | 0.02440 | 0.12000 | 0.05000 | 0.01952 |
| 75 | 0.14000 | 0.14000 | 0.08000 | 0.08000 | 0.02440 | 0.12000 | 0.05000 | 0.01952 |

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.

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.