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June 13, 2018

Timothy W. Viezer, PhD, CFA, CAIA, PRM
Chief Investment Officer
Sewerage and Water Board of New Orleans
625 St. Joseph Street
New Orleans, LA 70165

Re: January 1, 2018 Actuarial Valuation

Dear Dr. Viezer:

Following is a summary of the results of the actuarial valuation report of the Employees' Retirement System of the Sewerage and Water Board of New Orleans as of December 31, 2017.

This actuarial valuation has been performed on a basis consistent with that which was performed as of December 31, 2016, with the exception of the provision of a 15 year amortization contribution instead of 10 year amortization as in the past.

It should be noted that Exhibit III contains the Schedule of Funding Progress according to the requirements formerly mandated by Statement No. 25 (as modified by Statement No. 50) of the Governmental Accounting Standards Board (GASB #25 and #50). As described in that Exhibit III, these statements have been replaced by GASB Statements #67 and #68 and are addressed in a separate report.

Summarized below are the principal results of the actuarial valuation.

Summary of Valuation Results

	<u>12/31/2016</u>	<u>12/31/2017</u>
1. Number of Active Participants	998	1,083
2. Total Active Annual Payroll	\$ 35,363,156	\$ 41,822,648
3a. Plan 10 Year Amortization Contribution as a Percentage of Active Payroll	36.175%	N/A
3b. Plan 15 Year Amortization Contribution as a Percentage of Active Payroll	N/A	30.216%
4. Expected Employee Contribution as a Percentage of Active Payroll (See pp. 8-9 of report)	5.000%	5.000%

Timothy W. Viezer, PhD, CFA, CAIA, PRM
June 13, 2018
Page 2

	<u>12/31/2016</u>	<u>12/31/2017</u>
5a. Employer 10 Year Amortization Contribution as a Percentage of Active Payroll	31.175%	N/A
5b. Employer 15 Year Amortization Contribution as a Percentage of Active Payroll	N/A	25.216%
6. Plan 30 Year Amortization Contribution as a Percentage of Active Payroll	25.235%	25.170%
7. Expected Employee Contribution as a Percentage of Active Payroll (See pp. 8-9 of report)	5.000%	5.000%
8. Employer 30 Year Amortization (Minimum) Contribution as a Percentage of Active Payroll	20.235%	20.170%
9. Market Value of Plan Assets	\$ 224,356,261	\$ 235,284,317
10. Actuarial Value of Plan Assets (Adjusted Market Value Basis)	\$ 238,175,902	\$ 241,394,869
11. Valuation Unfunded Actuarial Liability	\$ 64,592,033	\$ 74,538,805
12. Ratio of UAL to Valuation Payroll	182.7%	178.2%
13. Funded Ratio	81.3%	79.4%

There have not been plan amendments or any changes to the actuarial assumptions or method since the immediately preceding valuation. The plan amendments adopted on November 19, 2014 involving definition of "average compensation" and employee contributions are the most recent substantive amendments to the plan's provisions which would have a material effect on the actuarial valuation results (see page 12, Exhibit I of the report).

Yours truly,



Michael A. Conefry, FCA, ASA, MAAA*
Actuary

* Member of the American Academy of Actuaries and qualified to render the Statements of Actuarial Opinion contained herein.

MAC:wp
Enclosures

ACTUARIAL VALUATION REPORT

**EMPLOYEES' RETIREMENT SYSTEM
OF THE SEWERAGE AND WATER BOARD
OF NEW ORLEANS**

Annual Actuarial Valuation
as of January 1, 2018

CONEFRY & COMPANY, LLC

ACTUARIAL AND EMPLOYEE BENEFIT CONSULTING
NEW ORLEANS, LOUISIANA

INTRODUCTION

We present in this report the results of our actuarial valuation of the Employees' Retirement System of the Sewerage and Water Board of New Orleans as of January 1, 2018. The plan is an actuarially funded qualified governmental defined benefit pension under the Internal Revenue Code, and we have performed this actuarial valuation using conventional and generally accepted actuarial methods, assumptions, and principles applicable to qualified defined benefit pension plans. We have performed the actuarial valuation using the Entry Age Normal Cost Method. A full description of the funding method is contained in Section II of the report.

The Summary of Plan Provisions presented in the Appendix is intended to describe the principal benefits provided by the plan, particularly from the perspective of their significance in affecting the actuarial liability and cost of the plan. The summary is not, of course, intended to be a comprehensive or complete description of all benefits payable under all circumstances under the pension plan.

EMPLOYEES' RETIREMENT SYSTEM
OF THE SEWERAGE AND WATER BOARD OF NEW ORLEANS

SUMMARY

I. FINANCIAL AND ACTUARIAL STATUS
As of January 1, 2018

Market Value of Assets	\$ 235,284,317	Page 1
Actuarial Value of Assets	\$ 241,394,869	Page 2

II. EMPLOYER AND EMPLOYEE CONTRIBUTIONS
For the Plan Year Beginning January 1, 2018

Total "15 Year Amortization" Contribution (As % of Payroll)	\$ 12,636,999 (30.216%)	Page 8
Expected Total Employee Contributions (As % of Payroll)	\$ 2,091,132 (5.000%)	Page 8
Employer "15 Year Amortization" Contribution (As % of Payroll)	\$ 10,545,867 (25.216%)	Page 8
Total "30 Year Amortization" Contribution (As % of Payroll)	\$ 10,526,730 (25.170%)	Page 9
Expected Total Employee Contributions (As % of Payroll)	\$ 2,091,132 (5.000%)	Page 9
Employer "30 Year Amortization" Contribution (As % of Payroll)	\$ 8,435,598 (20.170%)	Page 9
Net Actuarial Experience		Page 10

APPENDIX

Summary of Plan Provisions	Exhibit I - P. 12
Statement of Actuarial Basis for Funding Purposes	Exhibit II - P. 20
Statement of Accounting Information for Financial Statements	Exhibit III - P. 24
Active and Inactive Participant Profiles	Exhibit IV - P. 25
Market Value and Actuarial Value Investment Performance	Exhibit V - P. 32

CERTIFICATION

Page 36

I. FINANCIAL AND ACTUARIAL STATUS as of January 1, 2018

We have conducted this actuarial valuation using employee data and asset information furnished by the administrative office of the System. This section of the report presents a summary of the assets of the plan at Market Value, as well as the development of the Actuarial Value of Assets used in the funding method. The funding method used to determine the actuarial liabilities is described in Section II and the actuarial assumptions upon which the liabilities are based are summarized in Exhibit II of the report.

ASSETS

The following table showing the composition of the assets as of December 31, 2017 is based on information supplied by the administrative office and the auditors of the System.

Table 1

Statement of Assets
as of December 31, 2017

<u>Assets</u>	<u>Market Value</u>
Cash	\$ 230,946
Investments	<u>234,711,857</u>
Total Invested Assets	234,942,803
Plus accounts receivable	+341,514
Less accounts payable	<u>0</u>
Total Assets	\$ 235,284,317 *

- * The actuarial value of assets used in this valuation is Adjusted Market Value as determined in Table 2. D.R.O.P. account balances are included in the foregoing Assets and shown as an actuarial liability in Table 4, item (2)f.

ACTUARIAL VALUE OF ASSETS

Beginning with the January 1, 1998 actuarial valuation, the method of determining the actuarial value of assets was changed to adjusted market value from the former adjusted book value basis. The change had been necessitated because the former method, in our opinion and that of the auditors, was not "market value related" within the meaning of Statement No. 25 of the Government Accounting Standards Board (GASB #25) and its successor GASB Statements.

This revised method reflects actual market value performance over a seven year period ending on the valuation date. The market value performance is averaged over the seven year period by reflecting the actual external cash flow and adjusting each prior year's market value to the current valuation date using the actuarial interest assumption.

The following table develops the Adjusted Market Value of Assets to be used as the Actuarial Value of Assets in the actuarial valuation.

Table 2
Actuarial Value of Assets
As of December 31, 2017

Plan Year Ending	Beginning Market Value	Net External Cash Flow For Year	Market Value Inv. Income For Year	Ending Market Value	Market Value Performance For Year	Adj. Market Value Component
2011	205,240,285	-8,114,890	8,968,361	206,093,756	4.4578%	236,054,430
2012	206,093,756	-8,472,301	23,082,600	220,704,055	11.4351%	248,603,835
2013	220,704,055	-9,525,020	23,179,014	234,358,049	10.7339%	259,165,532
2014	234,358,049	-9,143,898	11,342,520	236,556,671	4.9416%	253,364,613
2015	236,556,671	-9,985,003	-4,144,141	222,427,527	-1.7896%	230,054,972
2016	222,427,527	-10,642,132	12,570,866	224,356,261	5.7902%	227,236,384
2017	224,356,261	-12,398,217	23,326,273	235,284,317	10.6924%	235,284,317
Years Included: 7		-68,292,418	98,336,450	Average Adj. MV: \$241,394,869		

II.

EMPLOYER AND EMPLOYEE CONTRIBUTIONS

for the Plan Year Beginning January 1, 2018

DESCRIPTION OF ACTUARIAL COST METHOD

Under the Entry Age Normal Cost Method, the normal cost of the plan is designed to be a level percentage of payroll, calculated on an aggregate basis, spread over the entire working lifetime of the participants. The future working lifetime is determined from each participant's hypothetical entry age into the plan assuming the plan had always been in existence, to his expected retirement date. The actuarial accrued liability is the amount of total liability not covered by future entry age normal costs. This amount is composed of the actuarial value of benefits already funded (assets) and those not yet funded (unfunded actuarial liability).

The plan's funding cost for the year is the sum of the Entry Age Normal Cost and the amount necessary to amortize the remaining unfunded actuarial liability as of the valuation date over the adopted amortization period.

Beginning with the January 1, 2007 actuarial valuation, a new amortization basis was established. The former amortization basis used a level dollar amortization for a ten (10) year "closed" (that is, with the remaining period reducing by one each year) amortization period from January 1, 2003 through December 31, 2012. This was replaced by level dollar amortization for "open" (that is, a constant number of years) ten (10) year amortization and thirty (30) year amortization periods effective on each valuation date. Effective with this actuarial valuation as of January 1, 2018, we present the amortization on closed periods of fifteen (15) years and thirty (30) years. These amounts are developed later in this section and presented in Tables 5 and 6.

Table 3
Entry Age Normal Cost for Plan Year
Beginning January 1, 2018

(1)	Actuarial Present Value at Entry Age of Expected Benefits to Plan Participants	\$ 22,275,003
(2)	Actuarial Present Value at Entry Age of Future Payroll of Active Participants	204,297,107
(3)	Normal Cost as a Percentage of Payroll: (1) divided by (2)	10.903%
(4)	Current Payroll of Active Participants *	41,822,648
(5)	Normal Cost: (3) x (4) (Assumed payable January 1, 2018)	\$ 4,559,923
(6)	Normal Cost, adjusted for monthly payments	\$ 4,704,433
* There are 1,083 active participants: 479-fully vested; 0-partially vested; 604-not vested.		

Table 4
Unfunded Actuarial Liability
as of January 1, 2018

(1)	Actuarial Present Value of Expected Benefits to Active Plan Participants		
(a)	Basic and Supplemental Retirement Benefit	\$ 96,656,313	
(b)	Death and Survivor Benefit	6,090,160	
(c)	Disability Benefit (Inc. suppl & surv.)	8,448,295	
(d)	Vesting Benefit	8,481,147	
(e)	Refund of Employee Contributions	<u>2,180,172</u>	
	Total Active		\$ 121,856,087
(2)	Actuarial Present Value of Expected Benefits to Inactive Plan Participants		
(a)	Regular Retirees	\$ 147,432,949	
(b)	Disability Retirement	7,534,188	
(c)	Survivors	7,904,121	
(d)	Terminated Vested	1,856,386	
(e)	D.R.O.P. Retirees (Future Benefits)	44,307,270	
(f)	D.R.O.P. Retirees (Account Balances)	<u>11,610,897</u>	
	Total Inactive		\$ 220,645,811
(3)	Total Actuarial Present Value of Expected Benefits to All Plan Participants		
	(1) + (2)		342,501,898
(4)	Actuarial Present Value of Future Payroll of Active Participants		243,678,107
(5)	Normal Cost as a Percentage of Payroll: (From Table 3)		10.903%
(6)	Actuarial Present Value of Future Normal Cost Contributions:		
	(4) x (5)		26,568,224
(7)	Actuarial Value of Assets (from Table 2)		241,394,869
(8)	Unfunded Actuarial Liability:		
	(3) - (6) - (7)		74,538,805

TOTAL CONTRIBUTION FOR PLAN YEAR BEGINNING January 1, 2018

Contribution to Amortize the Unfunded Actuarial Liability over 15 years

The amount of the contribution for a plan year equals the normal cost plus the level dollar amount necessary to amortize the Unfunded Actuarial Liability. The annual amount required to amortize the Unfunded Actuarial Liability of \$74,538,805 over 15 years at 7% annual interest (assuming monthly payments) is \$7,932,566.

Table 5

Total "15 Year Amortization" Contribution for the
Plan Year Beginning January 1, 2018

(1)	Normal Cost (From Table 3; assumed payable monthly)	\$ 4,704,433	
(2)	Net Annual charge Required for Amortization of Unfunded Actuarial Liability Over 10 year period beginning January 1, 2018 (See Above; Assumed payable monthly)	7,932,566	
(3)	Total Plan Contribution as of January 1, 2018: (1) + (2)	\$ 12,636,999 (30.216%)	*
(4)	Annual Employee Plan Contributions as of January 1, 2018 (See note below)	\$ 2,091,132 (5.000%)	*
(5)	Employer Contribution as of January 1, 2018: (3) - (4) (Assumed payable monthly)	\$ 10,545,867 (25.216%)	*

* Expressed as a percentage of annual participant payroll of \$41,822,648.

Note: Current actual employee contribution is 6% of payroll effective January 1, 2015. By Board Resolution R-248-2014, as long as the Retirement System is not 100% funded, the Employer Contribution percentage shall be calculated as if the Employee Contribution percentage has remained at 5% of payroll.

Contribution to Amortize the Unfunded Actuarial Liability over 30 years

The amount of the contribution for a plan year equals the normal cost plus the level dollar amount necessary to amortize the Unfunded Actuarial Liability. The annual amount required to amortize the Unfunded Actuarial Liability of \$74,538,805 over 30 years at 7% annual interest (assuming monthly payments) is \$5,822,297.

Table 6
Total "30 Year Amortization" Contribution for the
Plan Year Beginning January 1, 2018

(1)	Normal Cost (From Table 3; assumed payable monthly)	\$ 4,704,433	
(2)	Net Annual Charge Required for Amortization of Unfunded Actuarial Liability Over 30 year period beginning January 1, 2018 (see above) (Assumed payable monthly)	5,822,297	
(3)	Total Plan Contribution as of January 1, 2018: (1) + (2)	\$ 10,536,730 (25.170%)	*
(4)	Annual Employee Plan Contributions as of January 1, 2018 (See note below)	\$ 2,091,132 (5.000%)	*
(5)	Employer Contribution as of January 1, 2018: (3) - (4) (Assumed payable monthly)	\$ 8,435,598 (20.170%)	*

* Expressed as a percentage of annual participant payroll of \$41,822,648.

Note: Current actual employee contribution is 6% of payroll effective January 1, 2015. By Board Resolution R-248-2014, as long as the Retirement System is not 100% funded, the Employer Contribution percentage shall be calculated as if the Employee Contribution percentage has remained at 5% of payroll.

NET ACTUARIAL EXPERIENCE
for the Plan Year Beginning January 1, 2017

Actuarial experience refers to the comparison of actuarial results of each valuation with those expected from the previous valuation according to the actuarial assumptions. A decrease or increase in the Total Plan Contribution as a percentage of payroll is indicative of favorable (gains) or unfavorable (losses) experience, respectively. If the overall experience follows the general pattern indicated by the assumptions presented in the Appendix, the Total Plan Contribution (on a given amortization basis) as a percentage of payroll will remain relatively stable, except for routine fluctuations.

The total 15 year amortization contribution as a percentage of payroll decreased from 30.406% for the plan year beginning January 1, 2017 to 30.296% for the plan year beginning January 1, 2018. The total 10 year amortization contribution as a percentage of payroll decreased from 25.235% for the plan year beginning January 1, 2017 to 25.170% for the plan year beginning January 1, 2018. These decreases of 0.110% and 0.065% of payroll, respectively, are indicative of an overall actuarial gain for the most recent plan year. This gain represents the net decrease in the total plan contribution as the combined result of actuarial experience and the change in total plan contribution attributable to plan amendments, if any.

APPENDIX

EXHIBIT I

EMPLOYEES' RETIREMENT SYSTEM OF THE
SEWERAGE AND WATER BOARD OF NEW ORLEANS

SUMMARY OF PLAN PROVISIONS

EFFECTIVE DATE:

Authorized by Act Number 551, effective January 1, 1957; Last Restatement for Plan Qualification, January 27, 2011; Latest Restatement, April 17, 2013; last amendment date as of the date of performance of this valuation, November 19, 2014.

MEMBERSHIP:

Employees who become members as a condition of employment.

CREDITABLE SERVICE:

Prior service plus membership service for which credit is allowable. Also, one year service credit given for every 250 days of unused sick and annual leave. Credit for prior military service may be purchased (maximum 4 years) by active contributing member who is vested; lump sum payment required based on 4% of excess over first \$100 monthly average for each month claimed plus 7% compound interest. Military service available only to those who will not receive a benefit from another retirement system (except Social Security). There are also provisions for restoring service on behalf of certain leaves without pay such as for Katrina Disaster Leave and Workers' Compensation.

EARNABLE COMPENSATION:

Annual compensation paid to an employee; excluding on-call and stand-by pay or over-time.

AVERAGE COMPENSATION:

Average annual earned compensation of a member for highest thirty-six successive months of service as a member, minus \$1,200. For employees hired after December 31, 1995, the \$1,200 reduction was not applicable. Effective June 19, 2002, the \$1,200 reduction was eliminated for all employees. Periods without compensation are not used in determining the average compensation. For employees not yet eligible to retire as of December 31, 2014, the thirty-six month period was changed to forty-eight months effective January 1, 2017 and sixty months effective January 1, 2018.

EMPLOYEE CONTRIBUTIONS:

4% of earnable compensation through December 31, 2012; effective January 1, 2013, 5% of earnable compensation; effective January 1, 2015, 6% of earnable compensation. By Board Resolution R-248-2014, as long as the Retirement System is not 100% funded, the Employer Contribution percentage shall be calculated as if the Employee Contribution percentage has remained at 5% of payroll.

EXHIBIT I (Continued)

EMPLOYER CONTRIBUTIONS:

Certain percentage of earnable compensation of each member, determined on basis of regular interest and mortality tables adopted by the Board, and additional percentage of earnable compensation, determined by actuary.

RETIREMENT BENEFITS:

Eligibility:

Any age with 30 years of Service; age 60 and 10 years of Service; effective January 1, 1996, age 65 and 5 years of Service; age 70 with any Service. Effective June 19, 2002, age 60 and vested (with actuarial reduction) and any member whose age and service total 80 or more years may retire without reduction for age.

Benefits:

Retirement allowance, consisting of (1) and (2) below:

1) An annuity, which is the actuarial equivalent of employee's accumulated contribution; plus

2) An annual pension, which, together with above annuity, provides total retirement allowance equal to 2% of average compensation times first 10 years, plus 2 1/2% of average compensation times next 10 years, plus 3% of average compensation times next 10 years, plus 4% of average compensation times creditable service over 30 years. Effective June 19, 2002, the above percentages were changed to 2.5% for the first 25 years plus 4% for years over 25 years.

3) An additional annual pension equal to 2% of \$1,200 times first 10 years, plus 2 1/2% of \$1,200 times next 10 years, plus 3% of \$1,200 times next 10 years, plus 4% of \$1,200 times service over 30 years; if the employee was hired prior to 1996 and retires prior to age 65 on retirement allowance. Ceases at age 65 or receipt of first Social Security check, whichever comes first. Effective June 19, 2002, this additional benefit no longer applies except to those who retired prior to that date.

4) For service retirement prior to age 62 with less than 30 years of Service, (2) and (3) above are reduced by 3% for each year rounded to nearest day below the age of 62.

5) Effective January 1, 1997, a member may retire after 30 years of service, regardless of age, with no reduction in his benefit.

6) Maximum Benefit: Benefit no greater than 100% of average compensation, unless member has already accrued a larger benefit as of April 13, 1977.

EXHIBIT I (Continued)

7) Form of Benefit: Modified cash refund annuity. If a member dies after retirement and before receiving the amount of his accumulated contributions in annuity and pension payments, then lump sum balance of his contributions is paid to beneficiary.

8) Cost-of-Living: Effective July 1, 1992, for members that retired prior to January 1, 1984, if funds are available, each July 1st a 2% increase times the number of years retired will be given to members over age 65.

For members that retired on or after January 1, 1984, and are over age 65, each January 1st, increases in benefits based on the increase in the CPI, not to exceed 2%.

Spouses receiving a Joint and Survivor Annuity that have reached the age of 65 shall also receive an increase, based on the increase in the CPI, not to exceed 2%.

DISABILITY BENEFITS:

Eligibility:

10 years of credited service. (certified by physician nominated by Board).

Benefits:

1) A retirement allowance equal to the greater of: An annuity, which is the actuarial equivalent of the member's accumulated contributions at retirement; or

2) An annual pension equal to 75% of the accrued benefit based on service credits to the member had he continued in service until age 62.

3) Benefit offset by Workmen's Compensation benefits.

4) Effective 1/1/84, disability allowance is subject to the same COLA after age 65 as regular retirement.

DEATH BENEFITS:

Eligibility:

Death of member in active service.

Benefits:

Employee's accumulated contributions paid to beneficiary.

1) If member has 3 years Creditable Service, but less than 10 years, a lump sum benefit equal to the Member's accumulated contributions and 25% of the member's prior year earned compensation is payable to the designated beneficiary or estate.

EXHIBIT I (Continued)

2) If member dies in active service with less than three years Creditable Service, a Lump Sum Benefit equal to the Member's accumulated contributions is payable to the designated beneficiary or estate.

3) If, at date of death, member was eligible for retirement and leaves Surviving Spouse, Surviving Spouse shall be eligible for a Joint and 100% benefit or a lump sum refund of Employee's contributions.

4) If, at date of death, member was ineligible for retirement, but had at least 10 or more years of creditable service, then surviving spouse shall receive benefit equal to 80% of the former member's accrued benefit at death, payable at the later of the member's death or spouse's attainment of age 62.

5) If, at date of death, member was receiving a disability benefit and dies, his spouse shall receive 80% of the former member's disability retirement allowance payable at the later of the retiree's death or spouse's attainment of age 62. Eligible children shall receive 65% of the disability benefit payable until they reach age 18, age 25 if the child attends school full time or is mentally or physically disabled or until the spouse attains age 62.

6) The spouse's benefit shall be subject to the COLA after attaining age 65 as for a regular retiree.

SEPARATION BENEFITS:

1) A member that withdraws from service before age 60 with 10 years of Creditable Service may allow his accumulated contributions to remain on deposit until he is eligible to receive a separation retirement allowance. Effective June 19, 2002, only 5 years of Creditable Service is required.

2) Upon withdrawal without 10 years Creditable Service (or, after June 19, 2002, 5 years) Employee is entitled to a refund of his accumulated contributions or may allow contributions to remain on deposit for maximum of five years. In case of employee's death, accumulated contribution are paid to designated beneficiary.

Note:

If employee re-enters after receipt of refund and continues service thereafter for 18 months, he may repay amount of refund plus the amount of employee contributions, with interest at a rate of 4% for service prior to 1970 and 7% compounded annually to date of payment for service after January 1, 1970, to receive prior creditable service again.

EXHIBIT I (Continued)

OPTIONAL FORMS OF BENEFIT:

1) A member shall receive a retirement allowance payable for life. If he dies before receiving, in annuity payments, the value of his annuity at the time of his retirement, the balance is payable to his beneficiary.

2) A reduced benefit payable for the life of the member and continued to beneficiary after member's death. A specific percentage is chosen by the member at the time of retirement. Such percentage shall be an integral multiple of 5%, to a maximum of 100%.

3) A reduced benefit payable for the life of the member and 100% of that amount is paid to the spouse after member's death.

RECIPROCITY:

Effective July 16, 1974, provisions made for reciprocal transfers of service and funds between this System and Employees' Retirement System of the City of New Orleans, in the event an employee transfers from one employing agency to the other; service credits were transferred from sending system to receiving system provided all employee contributions plus earned interest and all employer contributions plus agreed-upon interest were transferred; effective September 23, 1993 (retroactive for transfers on and after October 17, 1988), agreement was amended to provide for a transfer from the sending system to the receiving system equal to the GASB #5 liability of the sending system at 7% interest, 5% salary scale, the remaining GASB #5 actuarial assumptions and the salary and benefit structure in effect for the sending system at time of transfer.

DROP ACCOUNT:

Effective January 1, 1996, any member who is eligible for a service retirement under Section 6(1) can participate in the DROP program:

1) A member can only participant once, and only up to three years. Effective June 19, 2002, the allowable period was increased to 5 years.

2) When a member joins the DROP, he stops contributing to and earning benefits in the system. Employer contributions also stop. His retirement benefit begins being paid into his DROP account.

EXHIBIT I (Continued)

3) Interest is credited to the separately invested DROP accounts at the actually earned rate at the end of each month (not including the month of withdrawal unless on the last day of the month), but not below zero. Members of the DROP receive no cost-of-living increases.

4) Upon termination of employment at the end of the specified period of DROP participation, the DROP account is paid out in a lump sum.

5) Continued employment after the end of the DROP period is possible only by reapplication to the Board by the employee. If rehired, that employee shall receive a lump sum of his DROP account balance as if he had retired. For DROP participants rehired after April 20, 2005, the retirement allowance that had been paid into the participant's DROP account shall be suspended while re-employed and the participant shall be treated in the same manner as a re-employed retiree.

EXHIBIT I (Continued)

SUMMARY OF SUBSTANTIVE PLAN CHANGES IN RECENT YEARS
HAVING AN IMPACT ON ACTUARIAL VALUATION RESULTS

September 23, 1993:

Reciprocity agreement with City of New Orleans amended, retroactive for transfers on and after October 17, 1988.

January 8, 1994:

Allows for purchase of credit for prior military service.

December 13, 1995:

Plan amended for qualification under Internal Revenue Code for Governmental Plans.

January 1, 1996:

The Deferred Retirement Option Plan was adopted to allow members terminating employment and accepting a service retirement allowance under plan section 6(1) to participate in this program.

Average Compensation amended to remove the \$1,200 reduction for employees hired after December 31, 1995.

Any member with 5 years of Creditable Service and attainment of age 65 may retire.

January 1, 1997:

For members retiring on or after January 1, 1997 and choose a Joint and Survivor option, if the beneficiary predeceases the retiree, the reduced benefit reverts back to the maximum amount upon the death of the spouse.

A member with 30 years of creditable service may retire, regardless of age, with no reduction in benefits.

Death benefit payable to the spouse of a deceased disabled retiree is now available immediately upon the retiree's death, on an actuarially equivalent basis.

June 21, 2000:

Disability benefit equal to 75% of the member's accrued benefit based on service credits to the member had he continued in service until age 62.

Eligible Dependent amended to add age 25 if the child attends school full-time or if the child is mentally or physically disabled.

EXHIBIT I (Continued)

SUMMARY OF SUBSTANTIVE PLAN CHANGES IN RECENT YEARS
HAVING AN IMPACT ON ACTUARIAL VALUATION RESULTS

June 21, 2000:

Death benefit payable to designated beneficiary or estate when there is no spouse or eligible dependents equal to the member's accumulated contributions at death plus 25% of the member's prior year's earnable compensation payable from the Trust fund.

January 1, 2001:

Any retiree with less than 30 years of Credited Service and under age 62, the benefit is reduced by 3% for each year of age rounded to the nearest day below age 62.

February 25, 2001:

Plan amended for the Uruguay Round Agreements Act, the Small Business Job Protection Act of 1996, Uniformed Services Employment & Reemployment Rights Act of 1994, the Taxpayer Relief Act of 1997, the Internal Revenue Service Restructuring and Reform Act of 1998 and the Community Renewal Tax Relief Act of 2000, (GUST).

June 19, 2002:

Benefit formula amended to 2.5% of first 25 years of service, plus 4.0% for each year of service in excess of 25 years, up to a maximum of 100% of pay. A Rule of 80 retirement eligibility (age plus years of service greater than or equal to 80) without age reduction was added. Eligibility to leave employee accumulated contributions on deposit for Separation Retirement was changed from 10 years to 5 years; the exclusion of the first \$1,200 of annual pay was eliminated; D.R.O.P. period was extended from 3 to 5 years.

January 31, 2011:

Interest on DROP accounts changed from "Credited Interest" to that actually earned on the separately invested DROP accounts, but not below zero.

January 1, 2013:

Employee contribution formula amended from 4% to 5% of earnable compensation.

November 19, 2014:

Employee contribution formula amended from 5% to 6% of earnable compensation effective January 1, 2015 (but see explanation on page 12). Period used in determining average compensation changed for employees not yet eligible to retire as of December 31, 2014, was changed to forty-eight months effective January 1, 2017 and sixty months effective January 1, 2018.

EXHIBIT II
EMPLOYEES' RETIREMENT SYSTEM
OF THE SEWERAGE AND WATER BOARD OF NEW ORLEANS
STATEMENT OF ACTUARIAL BASIS FOR FUNDING PURPOSES

Actuarial Funding Method:

Cost Method:	Entry Age Normal Cost Method.
Asset Valuation Method:	Adjusted Market Value. Refer to the explanation on page 2 of the report and development in Table 2.

Actuarial Assumptions

Interest:	7% compounded annually.
Mortality:	1971 Group Annuity Mortality Table for males and females. (See chart in the following pages for specific rates by age and sex).
Turnover:	Table developed from the 1977-1980 Actuarial Experience Study, as used by the prior actuary. (See chart in the following pages for specific rates by age).
Salary Increases:	5.0% compounded annually.
Cost of Living Increases:	Actuarial liabilities for future cost of living increases were included for both active and inactive participants as per the appropriate sections of the plan.

STATEMENT OF ACTUARIAL BASIS FOR FUNDING PURPOSES

Actuarial Assumptions (Continued)

Retirement:

It has been assumed that employees retire at a variation of the earliest age at which they would be eligible to retire (with reduced benefits, if applicable) as follows; if the earliest age of retirement eligibility is less than or equal to age 55, the assumed age at retirement is the earliest age plus one year, but not beyond age 55; if the earliest age of retirement eligibility is greater than age 55, the assumed age at retirement is the earliest age of retirement eligibility.

Disability Incidence:

The rates utilized in the 14th actuarial valuation of the U.S. Railroad Retirement System. (See chart in the following pages for specific rates by age).

Survivor Benefits:

85% of active participants are assumed to be married to spouses of equal age. Children's survivor benefits and spouse's disability benefits (in the event of the death of a member on disability) were estimated to be 10% of the related benefits giving rise to the secondary benefits being valued.

Other assumptions:

20% of participants terminating with a vested right were assumed to withdraw their accumulated contributions upon termination, while 80% were assumed to retain their vested deferred benefits by leaving contributions on deposit.

Accumulated employee contributions are credited with 2% interest compounded annually.

SEWERAGE AND WATER BOARD OF NEW ORLEANS RETIREMENT SYSTEM
JANUARY 1, 2018 ACTUARIAL VALUATION
ASSUMED RATES OF MORTALITY, WITHDRAWAL AND DISABILITY INCIDENCE BY AGE AND GENDER

AGE	MORTALITY		WITHDRAWAL	DISABILITY INCIDENCE
	MALE	FEMALE		
15	.000433	.000193	.368600	.001100
16	.000444	.000205	.368600	.001100
17	.000457	.000218	.368600	.001100
18	.000471	.000231	.358700	.001100
19	.000486	.000245	.346600	.001100
20	.000503	.000260	.332900	.001100
21	.000522	.000275	.317800	.001100
22	.000544	.000292	.301800	.001100
23	.000566	.000309	.285100	.001100
24	.000591	.000327	.268000	.001100
25	.000619	.000347	.250700	.001100
26	.000650	.000368	.233600	.001100
27	.000684	.000390	.216700	.001100
28	.000722	.000414	.200200	.001100
29	.000763	.000440	.184300	.001100
30	.000809	.000469	.169100	.001100
31	.000860	.000499	.154700	.001100
32	.000916	.000533	.141200	.001100
33	.000978	.000569	.128500	.001100
34	.001046	.000608	.116800	.001100
35	.001122	.000651	.106100	.001300
36	.001204	.000698	.096300	.001500
37	.001295	.000750	.087600	.001800
38	.001397	.000807	.079800	.002100
39	.001509	.000869	.072800	.002400
40	.001633	.000938	.066800	.003000
41	.001789	.001013	.061600	.003600
42	.002000	.001094	.057200	.004200
43	.002260	.001186	.053500	.004800
44	.002569	.001286	.050400	.005500
45	.002922	.001397	.047800	.006400
46	.003318	.001519	.045800	.007400
47	.003754	.001654	.044200	.008200
48	.004228	.001802	.042900	.009000
49	.004740	.001967	.041900	.009700
50	.005285	.002151	.041200	.011100
51	.005867	.002324	.040500	.012600
52	.006480	.002520	.040000	.014000
53	.007127	.002738	.040000	.015800
54	.007806	.002982	.040000	.017600
55	.008519	.003256	.040000	.019000
56	.009262	.003574	.040000	.020000
57	.010039	.003948	.040000	.021500
58	.010889	.004388	.040000	.025000
59	.011924	.004901	.040000	.029500
60	.013119	.005489	.040000	.034500
61	.014440	.006156	.040000	.039000
62	.015863	.006898	.040000	.051000
63	.017413	.007712	.040000	.051000
64	.019185	.008608	.040000	.051000
65	.021260	.009563	.040000	.051000

SEWERAGE AND WATER BOARD OF NEW ORLEANS RETIREMENT SYSTEM
 JANUARY 1, 2018 ACTUARIAL VALUATION
 ASSUMED RATES OF MORTALITY, WITHDRAWAL AND DISABILITY INCIDENCE BY AGE AND GENDER

AGE	MORTALITY		WITHDRAWAL	DISABILITY INCIDENCE
	MALE	FEMALE		
66	.023643	.010565	.040000	.051000
67	.026316	.011621	.040000	.051000
68	.029188	.012877	.040000	.051000
69	.032435	.014461	.040000	.051000
70	.036106	.016477	.040000	.051000
71	.040008	.019000	0.000000	.051000
72	.043827	.021911	0.000000	.051000
73	.047489	.025112	0.000000	.051000
74	.051221	.028632	0.000000	.051000
75	.055293	.032385	0.000000	.051000
76	.060068	.036408	0.000000	.051000
77	.065924	.040769	0.000000	.051000
78	.072595	.045472	0.000000	.051000
79	.079692	.050616	0.000000	.051000
80	.087431	.056085	0.000000	.051000
81	.095445	.061853	0.000000	.051000
82	.103691	.067936	0.000000	.051000
83	.112303	.074351	0.000000	.051000
84	.121116	.081501	0.000000	.051000
85	.130102	.089179	0.000000	.051000
86	.139315	.097468	0.000000	.051000
87	.148714	.106452	0.000000	.051000
88	.158486	.116226	0.000000	.051000
89	.168709	.126893	0.000000	.051000
90	.179452	.138577	0.000000	.051000
91	.190489	.151192	0.000000	.051000
92	.201681	.165077	0.000000	.051000
93	.212986	.180401	0.000000	.051000
94	.226535	.197349	0.000000	.051000
95	.241164	.216129	0.000000	.051000
96	.256204	.236970	0.000000	.051000
97	.272480	.258059	0.000000	.051000
98	.290163	.280237	0.000000	.051000
99	.309125	.304679	0.000000	.051000
100	.329825	.331630	0.000000	.051000

EXHIBIT III

December 31, 2017 DISCLOSURE INFORMATION ON FUNDING PROGRESS

This section is included to provide information which had been historically required by the Governmental Accounting Standards Board Statements Number 25 and 27 and is provided for historical continuity and consistency. GASB Statements 25 and 27 have been replaced by GASB Statements 67 and 68. These two statements have made extensive and fundamental changes in the nature of the financial disclosure requirements and have effectively removed the actual funding aspects of the plan from any direct involvement. The effective date of GASB 67 (with respect to the plan itself) is the first Plan Year beginning after June 15, 2013 (namely, the Plan Year beginning January 1, 2014). The effective date of GASB 68 (with respect to the Sewerage & Water Board as sponsoring employer) is the first Fiscal Year beginning after June 15, 2014 (namely, the Fiscal Year beginning January 1, 2015). The actuarial information for financial disclosure as required by these GASB Statements is presented in a separate report.

The Projected Benefit Obligation (PBO) as of December 31, 2017 is based on all of the assumptions outlined in Exhibit II including future salary growth. The Unfunded Accrued Liability (UAL) is that used in funding the plan and is developed in Table 4.

SCHEDULE OF FUNDING PROGRESS

	<u>12/31/2016</u>	<u>12/31/2017</u>
Interest Assumption	7.00%	7.00%

RATIO OF UAL TO VALUATION PAYROLL:

[1] Unfunded Accrued Liability (UAL)	\$ 64,592,033	\$ 74,538,805
[2] Valuation Annual Payroll	35,363,156	41,822,648
[3] Ratio: [1] divided by [2]	182.7%	178.2%

FUNDED RATIO:

[1] Projected Benefit Obligation (PBO)		
Inactive Plan Participants	\$ 203,942,615	\$ 222,814,836
Active Plan Participants	<u>89,744,429</u>	<u>83,252,592</u>
Total PBO	\$ 293,687,044	\$ 306,067,428
[2] Actuarial Value of Assets	238,715,902	241,394,869
[3] Funded Ratio: [2] divided by [1]	81.3%	79.4%

EXHIBIT IV

ACTIVE AND INACTIVE PARTICIPANT PROFILES

EMPLOYEES RETIREMENT SYSTEM OF THE SEWERAGE AND WATER BOARD OF NEW ORLEANS
01/1/2018 ACTIVE PARTICIPANT AGE VS SERVICE GRID
JANUARY 1, 2018 ACTUARIAL VALUATION

P. 26

ALL ACTIVE PARTICIPANTS													
AGE	YEARS OF SERVICE										TOTAL	TOTAL ANNUAL SALARIES	AVERAGE SALARY
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+				
0-19	4	0	0	0	0	0	0	0	0	4	119,400.02	29,850.01	
20-24	49	1	0	0	0	0	0	0	0	50	1,363,117.58	27,262.35	
25-29	124	19	1	0	0	0	0	0	0	144	4,631,681.33	32,164.45	
30-34	116	51	6	0	0	0	0	0	0	173	6,283,891.82	36,323.07	
35-39	87	23	11	3	1	0	0	0	0	125	4,754,977.46	38,039.82	
40-44	54	14	12	4	13	0	0	0	0	97	3,833,657.08	39,522.24	
45-49	42	22	10	13	16	10	0	0	0	113	4,455,485.91	39,429.08	
50-54	62	17	16	8	26	22	11	1	0	163	6,704,966.78	41,134.77	
55-59	45	20	18	2	13	11	15	4	0	128	5,539,107.32	43,274.28	
60-64	26	16	8	1	0	7	5	1	0	64	2,934,141.19	45,845.96	
65-69	10	4	0	1	2	1	1	0	0	19	1,041,231.26	54,801.65	
70-74	0	1	1	1	0	0	0	0	0	3	160,997.71	53,665.90	

Conefrey & Company, LLC

EMPLOYEES RETIREMENT SYSTEM OF THE SEWERAGE AND WATER BOARD OF NEW ORLEANS
01/1/2018 INACTIVE PARTICIPANT PROFILE
JANUARY 1, 2018 ACTUARIAL VALUATION

P. 27

----- REGULAR RETIREES -----

AGE	YEARS SINCE RETIREMENT										TOTAL	TOTAL ANNUAL BENEFIT	AVERAGE ANNUAL BENEFIT
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+				
45-49	2	0	0	0	0	0	0	0	0	2	79,460.88	39,730.44	
50-54	5	0	0	0	0	0	0	0	0	5	305,592.48	61,118.50	
55-59	11	30	2	0	0	0	0	0	0	43	1,615,684.08	37,574.05	
60-64	33	72	39	4	0	0	0	0	0	148	4,363,604.28	29,483.81	
65-69	13	61	63	23	0	0	1	0	0	161	4,544,919.00	28,229.31	
70-74	5	19	73	26	4	0	0	0	0	127	3,030,762.60	23,864.27	
75-79	0	2	16	25	12	1	0	0	1	57	1,223,522.76	21,465.31	
80-84	0	0	0	19	18	7	1	0	0	45	787,616.04	17,502.58	
85-89	0	0	0	3	7	7	2	0	0	19	352,224.96	18,538.16	
90+	0	1	0	1	0	2	5	0	1	10	114,091.92	11,409.19	
69	185	193	101	41	17	9	0	2	617	16,417,479.00	266081566		

Conefry & Company, LLC

EMPLOYEES RETIREMENT SYSTEM OF THE SEWERAGE AND WATER BOARD OF NEW ORLEANS
01/1/2018 INACTIVE PARTICIPANT PROFILE
JANUARY 1, 2018 ACTUARIAL VALUATION

P. 28

----- DISABLED RETIREES -----											
----- YEARS SINCE RETIREMENT -----											
AGE	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	TOTAL	AVERAGE ANNUAL BENEFIT
45-49	2	2	1	0	0	0	0	0	0	5	20,233.03
50-54	0	2	2	0	0	0	0	0	0	4	17,825.37
55-59	0	4	5	1	0	0	0	0	0	10	18,207.77
60-64	0	2	5	3	2	1	0	0	0	13	11,939.38
65-69	0	1	3	4	2	0	0	0	0	10	11,133.37
70-74	0	0	2	4	4	0	0	0	0	10	10,833.61
	2	11	18	12	8	1	0	0	0	52	14,027.43

EMPLOYEES RETIREMENT SYSTEM OF THE SEWERAGE AND WATER BOARD OF NEW ORLEANS
01/1/2018 INACTIVE PARTICIPANT PROFILE
JANUARY 1, 2018 ACTUARIAL VALUATION

P. 29

----- SURVIVORS -----

AGE	YEARS SINCE RETIREMENT										TOTAL	TOTAL ANNUAL BENEFIT	AVERAGE ANNUAL BENEFIT
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+				
20-24	0	1	0	0	0	0	0	0	0	1	13,884.12	13,884.12	13,884.12
45-49	0	1	0	0	0	0	0	0	0	1	2,527.20	2,527.20	2,527.20
50-54	0	1	0	0	0	0	0	0	0	1	3,979.20	3,979.20	3,979.20
55-59	2	2	2	0	0	0	0	0	0	6	27,661.32	4,610.22	4,610.22
60-64	14	13	1	1	0	0	0	0	0	29	235,709.28	8,127.91	8,127.91
65-69	9	3	5	0	0	1	0	0	0	18	166,773.12	9,265.17	9,265.17
70-74	1	9	1	3	0	0	0	0	0	14	87,016.68	6,215.48	6,215.48
75-79	5	4	1	1	0	1	0	0	0	12	151,930.32	12,660.86	12,660.86
80-84	1	4	5	2	0	1	0	0	0	13	71,874.48	5,528.81	5,528.81
85-89	3	1	0	0	1	1	0	0	0	6	80,028.12	13,338.02	13,338.02
90+	0	1	2	1	0	0	0	1	1	6	67,648.32	11,274.72	11,274.72
	35	40	17	8	1	4	0	1	1	107	909,032.16	8,495.63	8,495.63

P. 30

Conefry & Company, LLC

SEWERAGE AND WATER BOARD OF NEW ORLEANS RETIREMENT SYSTEM
12/31/2017 TERMINATED VESTED EMPLOYEES WITH DEFERRED BENEFITS

NAME	EMPLOYEE ID NUMBER	S E X	DATE OF BIRTH	DATE OF TERMINATION	(BASIC) INIT. MO. BENEFIT	(BASIC) CURR. MO. BENEFIT	SUPPL. MONTHLY BENEFIT	ACCUMULATED EMPLOYEE CONTRIBS.
769	M	M	11/05/59	3/24/2001	1,812.12	1,812.14	36.96	31,447.13
770	M	M	8/19/71	5/04/2006	0.00	435.87	0.00	7,004.63
771	M	M	4/14/58	1/11/1994	250.44	250.44	26.25	7,540.24
772	M	M	2/24/67	11/08/2004	0.00	1,110.29	0.00	21,156.73
773	M	M	1/06/66	2/24/2016	0.00	2,077.08	0.00	35,432.83
774	M	M	3/29/62	8/08/2007	0.00	2,133.13	0.00	23,833.94
775	M	M	8/29/62	1/13/1999	337.93	337.93	21.25	7,605.62
776	M	M	7/12/65	1/05/2017	0.00	1,419.01	0.00	23,994.84
777	M	M	2/25/58	1/13/2007	0.00	1,305.16	0.00	25,960.64
778	M	M	2/06/61	3/16/2011	0.00	0.00	0.00	10,376.09
779	F	F	10/17/76	5/29/2009	0.00	301.10	0.00	4,196.67
780	F	F	5/22/84	1/09/2016	708.34	708.34	0.00	16,659.45
781	M	M	7/24/70	3/06/2017	1,454.35	1,454.35	0.00	27,306.67
782	M	M	6/18/80	6/19/2017	361.98	361.98	0.00	10,642.02
783	M	M	11/30/55	4/11/2007	0.00	507.35	0.00	7,034.37
784	F	F	6/25/61	7/08/1995	555.81	555.81	22.50	14,099.34
785	M	M	11/02/58	10/15/2017	2,325.35	2,325.35	0.00	63,269.20
786	F	F	11/22/58	10/24/1999	930.15	930.15	28.75	16,496.91
787	M	M	1/13/69	4/21/2006	0.00	1,550.40	0.00	24,767.31
788	F	F	9/18/75	7/05/2017	497.68	497.68	0.00	15,029.82
789	M	M	7/27/61	6/21/1996	1,099.34	1,099.34	23.75	19,182.41
790	F	F	4/11/83	8/20/2016	715.38	715.38	0.00	17,404.23
791	M	M	11/22/53	12/04/2000	1,086.60	1,086.61	31.81	32,383.78
792	M	M	9/24/60	9/07/2000	688.67	688.68	40.37	14,593.58
793	M	M	12/17/62	3/31/2006	0.00	1,324.56	0.00	21,895.91
794	M	M	4/03/68	3/06/2017	1,485.88	1,485.88	0.00	28,603.34
795	F	F	1/01/78	12/23/2016	1,662.04	1,662.04	0.00	30,068.27
796	M	M	6/05/67	8/31/2016	1,925.22	1,925.22	0.00	31,645.63
TOTALS:					19,974.36	30,062.27	231.64	589,631.60

TOTAL COUNT: 28

EXHIBIT V

MARKET VALUE AND ACTUARIAL VALUE ASSET INVESTMENT PERFORMANCE

EMPLOYEES' RETIREMENT SYSTEM OF THE SEWERAGE AND WATER BOARD OF NEW ORLEANS
ESTIMATED MARKET VALUE INVESTMENT PERFORMANCE
BY CALENDAR YEAR

PLAN YEAR ENDING	BEGINNING MARKET VALUE	EMPLOYER CONTRIBUTIONS FOR YEAR	EMPLOYEE CONTRIBUTIONS FOR YEAR	TRANSFERS IN FOR YEAR	TOTAL BENEFIT PAYMENTS FOR YEAR	TRANSFERS OUT FOR YEAR	NET EXTERNAL CASH FLOW FOR YEAR	MARKET VALUE INV. INCOME FOR YEAR	ENDING MARKET VALUE	MARKET VALUE INV. PERFORMANCE FOR YEAR
12/31/91	56,348,353	4,524,382	1,001,436	0	4,460,555	0	1,065,263	11,331,152	68,744,768	19.9208%
12/31/92	68,699,004	4,980,959	1,113,066	0	4,988,329	0	1,105,696	5,789,535	75,594,235	8.3601%
12/31/93	75,594,235	4,873,366	1,092,713	0	4,978,593	0	1,287,486	8,471,584	85,353,305	11.1120%
12/31/94	85,353,305	5,102,920	1,298,780	0	5,220,801	0	1,180,899	-2,682,882	83,051,322	-3.1217%
12/31/95	83,851,322	5,188,055	1,595,149	0	5,733,411	0	849,793	22,390,520	107,091,635	26.5680%
12/31/96	107,091,635	5,678,507	1,463,218	0	5,704,458	0	1,437,267	12,894,655	121,423,557	11.9605%
12/31/97	121,423,557	5,933,289	1,202,021	0	6,410,573	0	724,737	21,841,187	143,989,481	17.9341%
12/31/98	143,989,481	5,448,823	1,138,063	0	6,573,992	0	12,894	13,756,662	157,759,037	9.5535%
12/31/99	157,759,037	5,151,389	1,028,094	0	6,928,999	0	-749,516	16,013,013	173,022,534	10.1745%
12/31/00	173,022,534	5,444,048	1,053,495	0	7,317,215	0	-819,672	5,658,247	177,861,109	3.2780%
12/31/01	177,861,109	5,417,854	1,040,680	0	7,632,745	0	-1,174,211	-1,677,973	175,008,925	-0.9465%
12/31/02	175,008,925	2,931,065	1,089,543	0	7,625,705	0	-3,605,097	-15,455,327	155,948,501	-8.9231%
12/31/03	155,948,501	3,391,535	1,097,183	0	9,184,249	0	-4,695,531	36,142,887	187,395,857	23.5304%
12/31/04	187,395,857	3,721,034	1,120,776	0	8,884,614	0	-4,042,804	19,502,120	202,855,173	10.5204%
12/31/05	202,855,173	3,716,381	1,176,637	714,343	10,177,467	0	-4,570,106	7,713,678	205,998,745	3.8459%
12/31/06	205,998,745	3,343,713	982,418	2,357,005	12,231,855	0	-5,548,719	28,734,146	229,184,172	14.1391%
12/31/07	229,184,172	3,885,124	1,014,461	1,854,239	12,812,727	0	-6,058,903	8,667,155	231,792,424	3.8324%
12/31/08	231,792,424	4,915,512	1,143,858	958,605	13,269,799	0	-6,251,824	-59,122,504	166,418,096	-25.8553%
12/31/09	166,418,096	5,247,031	1,161,744	516,393	14,231,876	0	-7,306,708	31,912,755	191,024,143	19.6067%
12/31/10	191,024,143	5,146,081	1,190,712	849,540	15,409,624	0	-8,223,289	22,439,431	205,240,285	12.0053%
12/31/11	205,240,285	5,436,700	1,161,996	1,233,504	15,947,090	0	-8,114,890	8,968,361	206,093,756	4.4578%
12/31/12	206,093,756	6,114,997	1,128,257	1,690,683	17,406,238	0	-8,472,301	23,082,600	220,704,055	11.4351%
12/31/13	220,704,055	5,946,614	1,465,774	1,065,165	18,002,573	0	-9,525,020	23,179,014	234,358,049	10.7339%
12/31/14	234,358,049	6,055,890	1,535,723	2,001,222	18,748,955	0	-9,156,120	11,354,742	236,556,671	4.9416%
12/31/15	236,556,671	6,506,652	1,905,689	1,847,259	20,244,603	0	-9,985,003	-4,144,141	222,427,527	-1.7896%
12/31/16	222,427,527	6,407,201	2,064,387	1,629,756	20,742,211	0	-10,640,867	12,569,601	224,356,261	5.7896%
12/31/17	224,356,261	7,239,467	2,139,705	2,416,042	24,193,431	0	-12,398,217	23,326,273	235,284,317	10.6924%
Number of Years Included: 27										
								-113,674,763	292,656,491	

**EMPLOYEES' RETIREMENT SYSTEM OF THE SEWERAGE AND WATER BOARD OF NEW ORLEANS
ESTIMATED INVESTMENT PERFORMANCE BY MARKET VALUE AND ACTUARIAL VALUE OF ASSETS
BY CALENDAR YEAR**

YEAR ENDING	ENDING MARKET VALUE	MARKET VALUE INV. PERF. FOR YEAR	MARKET VALUE MEAN FUND	ACTUARIAL VALUE MEAN FUND	ENDING ACTUARIAL VALUE OF ASSETS	ACTUARIAL ASSETS INV. PERF. FOR YR
P. 34						
12/31/1991	68,744,768	19.9208%	56,880,985	58,063,594	64,921,832	10.8943%
12/31/1992	75,594,235	8.3601%	69,251,852	65,474,680	72,541,969	9.9496%
12/31/1993	85,353,305	11.1120%	76,237,978	73,185,712	81,932,422	11.0718%
12/31/1994	83,851,322	-3.1217%	85,943,755	82,522,872	87,957,901	5.8706%
12/31/1995	107,091,635	26.5680%	84,276,219	88,382,798	100,059,569	12.7308%
12/31/1996	121,423,557	11.9605%	107,810,269	100,778,203	114,805,212	13.2056%
12/31/1997	143,989,481	17.9341%	121,785,926	115,167,581	120,911,255	4.6726%
12/31/1998	157,759,037	9.5535%	143,995,928	120,917,702	134,901,231	11.5592%
12/31/1999	173,022,534	10.1745%	157,384,279	134,526,473	149,976,441	11.7633%
12/31/2000	177,861,109	3.2780%	172,612,698	149,566,605	164,845,672	10.4896%
12/31/2001	175,008,925	-9.465%	177,274,004	164,258,567	180,737,128	10.3895%
12/31/2002	155,948,501	-8.9231%	173,206,377	178,934,580	187,892,718	6.0138%
12/31/2003	187,395,857	23.5304%	153,600,736	185,544,953	196,697,432	7.2760%
12/31/2004	202,855,173	10.5204%	185,374,455	194,676,030	204,706,452	6.1907%
12/31/2005	205,998,745	3.8459%	200,570,120	202,421,399	209,829,340	4.7885%
12/31/2006	229,184,172	14.1391%	203,224,386	207,054,981	217,143,723	6.2124%
12/31/2007	231,792,424	3.8324%	226,154,721	214,114,272	223,583,589	5.8374%
12/31/2008	166,418,096	-25.8553%	228,666,512	220,457,677	222,598,640	2.3891%
12/31/2009	191,024,143	19.6067%	162,764,742	218,945,286	228,999,660	6.2608%
12/31/2010	205,240,285	12.0053%	186,912,499	224,888,016	230,298,898	4.2343%
12/31/2011	206,093,756	4.4578%	201,182,840	226,241,453	229,137,699	3.0736%
12/31/2012	220,704,055	11.4351%	201,857,606	224,901,549	229,633,410	3.9875%
12/31/2013	234,358,049	10.7339%	215,941,545	224,870,900	226,423,894	2.8085%
12/31/2014	236,556,671	4.9416%	229,779,989	221,845,834	223,689,647	2.8947%
12/31/2015	222,427,527	-1.7896%	231,564,170	218,697,146	233,572,291	9.0845%
12/31/2016	224,356,261	5.7896%	217,107,094	228,251,858	238,715,902	6.9154%
12/31/2017	235,284,317	10.6924%	218,157,153	232,516,794	241,394,869	6.4843%

Conefry & Company, LLC

EMPLOYEES' RETIREMENT SYSTEM OF THE SEWERAGE AND WATER BOARD OF NEW ORLEANS
ESTIMATED INVESTMENT PERFORMANCE
BY CALENDAR YEAR

P. 35

PLAN YEAR ENDING	BEGINNING MARKET VALUE	NET EXTERNAL		MARKET VALUE		MARKET VALUE INVESTMENT PERFORMANCE			ACTUARIAL ASSET VALUE INVESTMENT PERFORMANCE		
		CASH FLOW FOR YEAR	INV. INCOME FOR YEAR	ENDING MARKET VALUE	MARKET VALUE	FOR YEAR	CUMULATIVE	AVERAGE	FOR YEAR	CUMULATIVE	AVERAGE
12/31/91	56,348,353	1,065,263	11,331,152	68,744,768	19,9208%	19.92%	19.92%	19.92%	10.89%	10.89%	10.89%
12/31/92	68,699,004	1,105,696	5,789,535	75,594,235	8.3601%	29.95%	29.95%	13.99%	9.95%	21.93%	10.42%
12/31/93	75,594,235	1,287,486	8,471,584	85,353,305	11.1120%	44.35%	44.35%	13.03%	11.07%	35.43%	10.64%
12/31/94	85,353,305	1,180,899	-2,682,882	83,851,322	-3.1217%	39.88%	39.88%	8.75%	5.87%	43.38%	9.63%
12/31/95	83,851,322	849,793	22,390,520	107,091,635	26.5680%	77.04%	77.04%	12.10%	12.73%	61.63%	10.08%
12/31/96	107,091,635	1,437,267	12,894,655	121,423,557	11.9605%	98.22%	98.22%	12.08%	13.21%	82.98%	10.59%
12/31/97	121,423,557	724,737	21,841,187	143,989,481	17.9341%	133.77%	133.77%	12.90%	4.67%	91.52%	9.73%
12/31/98	143,989,481	12,894	13,756,662	157,759,037	9.5535%	156.10%	156.10%	12.47%	11.56%	113.66%	9.96%
12/31/99	137,759,037	-749,516	16,013,013	173,022,534	10.1745%	182.15%	182.15%	12.22%	11.76%	138.80%	10.15%
12/31/00	173,022,534	-819,672	5,658,247	177,861,109	3.2780%	191.40%	191.40%	11.29%	10.49%	163.85%	10.19%
12/31/01	177,861,109	-1,174,211	-1,677,973	175,008,925	-9.465%	188.65%	188.65%	10.12%	10.39%	191.26%	10.21%
12/31/02	175,008,925	-3,605,097	-15,455,327	155,948,501	-8.9231%	162.89%	162.89%	8.39%	6.01%	208.77%	9.85%
12/31/03	155,948,501	-4,695,551	36,142,887	187,395,857	23.5304%	224.75%	224.75%	9.48%	7.28%	231.24%	9.65%
12/31/04	187,395,857	-4,042,804	19,502,120	202,855,173	10.5204%	258.91%	258.91%	9.56%	6.19%	251.75%	9.40%
12/31/05	202,855,173	-4,570,106	7,713,678	205,998,745	3.8459%	272.72%	272.72%	9.17%	4.79%	268.59%	9.09%
12/31/06	205,998,745	-5,548,719	28,734,146	229,184,172	14.1391%	325.42%	325.42%	9.47%	6.21%	291.49%	8.90%
12/31/07	229,184,172	-6,058,903	8,667,155	231,792,424	3.8324%	341.72%	341.72%	9.13%	5.84%	314.34%	8.72%
12/31/08	231,792,424	-6,251,824	-59,122,504	166,418,096	-25.8553%	227.51%	227.51%	6.81%	2.39%	324.24%	8.36%
12/31/09	166,418,096	-7,306,708	31,912,755	191,024,143	19.6067%	291.72%	291.72%	7.45%	6.26%	350.80%	8.25%
12/31/10	191,024,143	-8,223,289	22,439,431	205,240,285	12.0053%	338.75%	338.75%	7.67%	4.23%	369.89%	8.04%
12/31/11	205,240,285	-8,114,890	8,968,361	206,093,756	4.4578%	358.31%	358.31%	7.52%	3.07%	384.33%	7.80%
12/31/12	206,093,756	-8,472,301	23,082,600	220,704,055	11.4351%	410.72%	410.72%	7.69%	3.99%	403.64%	7.63%
12/31/13	220,704,055	-9,525,020	23,179,014	234,358,049	10.7339%	465.56%	465.56%	7.82%	2.81%	417.79%	7.41%
12/31/14	234,358,049	-9,156,120	11,354,742	236,556,671	4.9416%	493.49%	493.49%	7.70%	2.89%	432.78%	7.22%
12/31/15	236,556,671	-9,985,003	-4,144,141	222,427,527	-1.7896%	482.87%	482.87%	7.31%	9.08%	481.18%	7.29%
12/31/16	222,427,527	-10,640,867	12,569,601	224,356,261	5.7896%	516.61%	516.61%	7.25%	6.92%	521.37%	7.28%
12/31/17	224,356,261	-12,398,217	23,326,273	235,284,317	10.6924%	582.54%	582.54%	7.37%	6.48%	561.66%	7.25%

Conefry & Company, LLC

Number of Years Included: 27

PERFMAS.T.R1

CERTIFICATION

The foregoing report presents fairly the actuarial position of the Employees' Retirement System of the Sewerage and Water Board of New Orleans as of January 1, 2018 in accordance with generally accepted actuarial principles applied on a basis consistent with the preceding valuation, except where noted. In our opinion, the assumptions used in preparing the liabilities and estimated costs are reasonably related to the experience of the plan and to reasonable expectations and represent our best estimate of anticipated experience under the plan.

CONEFRY & COMPANY, L.L.C.



Michael A. Conefry, FCA, ASA, MAAA, MSPA
Enrollment Number 17-1235

New Orleans, Louisiana
May, 2018
V201712

Sewerage & Water Board of New Orleans



**Chief Investment Officer's Presentation to the
Pension Committee**

May 8, 2018

June Meeting Agenda

- Executive Session: disability retirement application
- Presentation of Actuarial Valuation
- Discussion of Draft Funding Policy
- Discussion of amending Investment Objectives



ERS Mission Statement

- *Prudently manage an actuarially sound pension fund*
- *solely in the interest of participants and beneficiaries*
- *in a cost-effective manner.*



Discussion

PROPOSED FUNDING POLICY



Current Versus Proposed Funding Policy

3 Core Elements		Current	Proposed?
Actuarial Cost Method	Entry Age Normal Cost	Entry Age Normal Cost	Entry Age Normal Cost
Asset Smoothing Method	7-year average	7-year average with 60%/140% corridor?	
Amortization Policy	30-Year Open	15-Year Closed?	
Employee Contribution	6%	6%	
Employer Contribution	Calculated as if employee contribution remained at 5% of payroll	Total plan contribution minus employee contribution of 6%?	
Actuarial Valuation	Annually	Annually	
Experience Study		Every 5 years	
Asset-Liability Study		Every 5 years	



Consensus on Best Practice for Funding Policy

Table 1: Considerable Consensus on Funding Policy Objectives: How the Three Actuarial Organizations Compare to One Another and to the GFOA Best Practice

Objective	CCA PPC White Paper	AAA Issue Brief	BRP/SOA Report	GFOA Best Practice
Fund the expected cost of all promised benefits (i.e., fund normal cost plus 100% of any unfunded actuarial liabilities).	✓	✓	✓	✓
Match annual contributions to fund the cost of benefits to years of service (i.e., target demographic matching or generational equity).	✓	✓	✓	✓
Have costs emerge stably and predictably (i.e., manage contribution volatility).	✓	✓	✓	✓
Balance competing funding-policy objectives.	✓	✓	✓	✓
Identify risks ² that could make it difficult to achieve funding objectives.	✓	✓	✓	
Communicate how the funding-policy objectives will be achieved by the contribution allocation procedure (accountability and transparency).	✓	✓		✓
Establish an enforcement mechanism for making contributions on a consistent, actuarially determined basis: actually fund the "actuarially determined contribution" (ADC).	✓	✓	✓	✓

¹ The CCA PPC White Paper talks specifically about a balance between targeting generational equity and managing contribution volatility.

² The CCA PPC White Paper focuses on agency risk, which refers to the possibility that interested parties (agents) may try to influence cost calculations in directions viewed as consistent with their particular interests.³ The AAA Issue Brief also cites agency risk, but adds investment, demographic and "other" risks. The BRP/SOA Report focuses primarily on investment risk and related disclosures.

³ Although the CCA PPC White Paper does not require an explicit enforcement mechanism, all of its guidance is developed under the presumption that the plan will be funded in accordance with its actuarial funding policy.

Segal Consulting, Public Sector Letter "Actuarial Funding Policy Guidance: Comparison of Recommendations Reveals Considerable Consensus - and a Few Notable Differences," October 2014, p. 2.



Estimated Costs and Savings*

- Potential Cost
 - 15-Year Closed: Additional employer contributions for each of 15 years:
 - \$2,110,269 = \$10,545,867-\$8,435,598
 - 30-Year Open: indefinitely into the future, with gradual reductions in the amount annually over time.
 - \$5,822,297
- Potential Savings
 - 15-Year Closed would be fully funded at the end of 15 years.
 - 30-Year Open would have these amounts remaining of unfunded accrued actuarial liability:
 - \$63,536,877 after 15 years
 - \$54,67,350 after 30 years

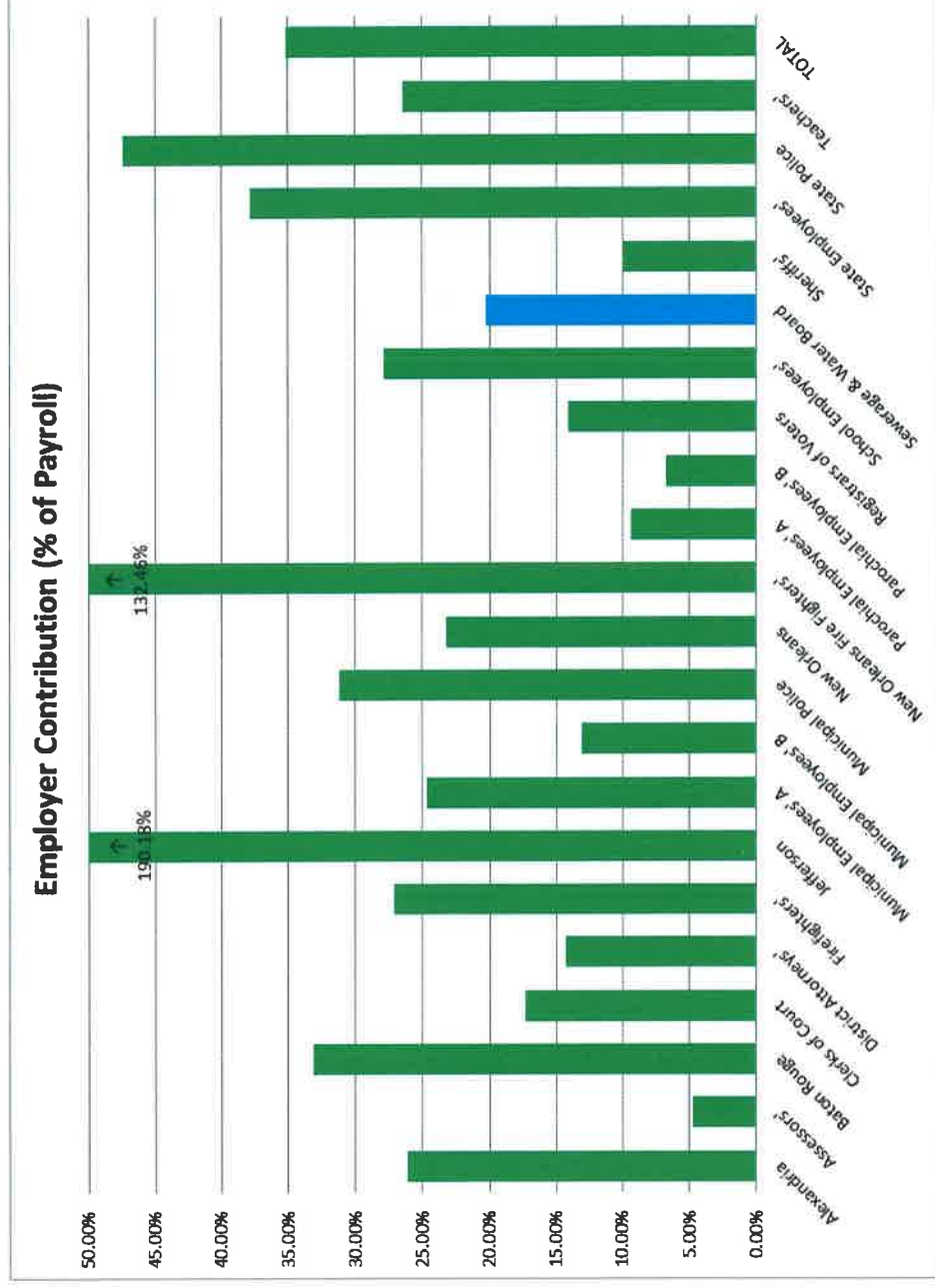
*Source: Conefry & Company LLC



Sewerage & Water Board of New Orleans

<http://swbno.org>

Comparison of Louisiana Peers' Employer Contribution



Sewerage & Water Board of New Orleans

<http://swbno.org>

S&WB Budget Implications

- Moving to a 15-year closed-end amortization would increase the Actuarially Determined Contribution by \$2,110,269.
- That estimated increase is:
 - 0.7% of the Total Operating Budget Expense of \$302,642,334 (April 25, 2018);
 - 4.2% of the Total Payroll related Expense of \$49,793,162 (April 25, 2018);
 - 41 of the 1,814 budgeted positions as of January 1, 2018 (as of April 25, 2018 there are 1,253 budgeted positions).



Other Considerations

- The condition of the pension plan and the ability of the plan sponsor to fulfill its projected pension obligations is an important consideration in evaluating the credit quality of bond issuers.
- Defined benefit pensions are highly valued by employees in the public sector. When given the choice between defined benefit (“DB”) or defined contribution plans (“DC”), public employees overwhelmingly choose a DB pension plan.**
- Moving from a DB to a DC plan does nothing to closing any existing funding shortfalls and can increase costs because DC plans do not have the economic efficiencies of DB plan, operating two plans is more costly than just one plan, and the loss of new members makes it more difficult to finance the unfunded obligations of the DB plan.**
- The implications of the proposed funding policy should be evaluated within the context of the Asset-Liability Study presentation in July.

**Source: Jennifer Erin Brown and Matt Larrabee, “Decisions, Decisions: An Update on Retirement Plan Choices for Public Employees and Employers,” National Institute on Retirement Security and Milliman, August 2017.



Sewerage & Water Board of New Orleans

<http://swbno.org>

Governance

PROPOSED CHANGES TO THE INVESTMENT POLICY STATEMENT



Proposed Changes

- Reorganized into 3 Parts
- Add Mission Statement
- Revised Duties and Responsibilities
- Revised Investment Objective
- Added Investment Philosophy
- Added Funding Policy



Updates

OLD BUSINESS



Follow Up From May Meeting

- Mr. Sloss and Mr. Lewis Stirling requested that Dr. Viezer document how the existing situation would translate into a governance matrix to facilitate comparison.
- Ms. Gleason and Mr. Sloss asked that the role of the General Investment Consultant as an “extension of the Chief Investment Officer” be clarified to indicate a business continuity/back-up role.
- The approval of policies that affect both S&WB and ERS and the provision of in-kind resources should involve both the Board of Directors and Board of Trustees.
- Chairman Peychaud asked S&WB staff to continue to work together and to bring another discussion draft that incorporated the Pension Committee’s desired changes into the S&WB Professional Services Procurement Policy #95.



NEW BUSINESS?



New Business

- Review the Reciprocity Agreement with NOMERS.
- Assignment of custody contract.



Sewerage & Water Board of New Orleans

<http://swbno.org>

July Meeting Agenda

- Callan's Presentation of Phase I Asset Liability Study
- Draft Amended Investment Policy Statement will be distributed for review



Appendix A

CFA Institute's Code of Conduct for Members of a Pension Scheme Governing Body

1. Act in good faith and in the best interest of the scheme participants and beneficiaries.
2. Act with prudence and reasonable care.
3. Act with skill, competence, and diligence.
4. Maintain independence and objectivity by, among other actions, avoiding conflicts of interest, refraining from self-dealing, and refusing any gift that could reasonably be expected to affect their loyalty.
5. Abide by all applicable laws, rules, and regulations, including the terms of the scheme documents.
6. Deal fairly, objectively, and impartially with all participants and beneficiaries.
7. Take actions that are consistent with the established mission of the scheme and the policies that support that mission.
8. Review on a regular basis the efficiency and effectiveness of the scheme's success in meeting its goals, including assessing the performance and actions of scheme service providers, such as investment managers, consultants, and actuaries.
9. Maintain confidentiality of scheme, participant, and beneficiary information.
10. Communicate with participants, beneficiaries, and supervisory authorities in a timely, accurate, and transparent manner.



Appendix B

Committee & Board Decisions

I. FOUNDATIONAL DECISIONS (October 2017 – December 2017)

A. Clarify governance focus

- ✓ Amend the current IPS to reflect 2015 decisions.
- ✓ Adopt an ERS Mission Statement
- ✓ Adopt the CFA Code of Conduct for Members of a Pension Governing Body
- ✓ Adopt a resolution to strongly encourage BOT to adhere to LA RS 11:185 Trustee Education requirements starting September 2018.

B. Decisions needed to complete Asset-Liability Study By June 2018

5. Amend and prioritize investment objectives

- ✓ Hire Asset-Liability Consultant

C. Decisions needed to issue RFP for General Investment Consultant

7. Adopt Investment Philosophy

8. Agree upon an investment manager search process (based upon philosophy & policies)

9. Agree upon investment consultant duties and governance matrix



Appendix B

Committee & Board Decisions

II. MAJOR DECISIONS (May 2018 – September 2018)*

D. Preparation

10. Governance Matrix:

- a. Who decides (and how) benefits?
- b. Who decides (and how) employer contributions?
- c. Who decides (and how) employee contributions?
- d. Who decides (and how) investment policy?

11. Hire General Investment Consultant

12. Adopt Statement of Risk Capacity and Risk Appetite

E. The BIG THREE Decision-Making

13. Benefit Policy

14. Contribution Policy

- a. Employee
- b. Employer

15. Investment Policy – Asset Allocation



Appendix B

Committee & Board Decisions

III. FORMALIZE CUMULATIVE DECISIONS (September 2018 – December 2018)*

F. Update Documents

16. Amend Investment Policy Statement

17. Amend Bylaws

18. Amend Rules and Regulations

IV. IMPLEMENT ASSET ALLOCATION (September 2018 – March 2019)*

G. Portfolio Construction

H. Investment Managers

*Dates are tentative and subject to revision.



Appendix C

PRMIA Principles of Good Governance*

- Key Competencies
- Resources and Processes
- Ongoing Education and Development
- Compensation Architecture
- Independence of Key Parties
- Risk Appetite
- External Validation
- Clear Accountability
- Disclosure and Transparency
- Trust, honesty and fairness of key people



*Professional Risk Managers' International Association, 2009

Sewerage & Water Board of New Orleans



Re-Building the City's Water Systems for the 21st Century

Proposed Governance Matrix

ACTIONS	Delegate→																						← Reporting	
	ACTORS																							
	Governing Fiduciaries										Managing Fiduciaries					Operating Fiduciaries								
	Legislature	Courts	Mayor	S&WB Board of Directors	BOD Audit Committee	BOD Governance Committee	BOD Fin. & Admin. Committee	BOD Strategy Committee	ERS Board of Trustees	BOT Pension Committee	Executive Director	Special Counsel	Deputy Director Administration	Chief Investment Officer	Chief Financial Officer	General Consultant	Investment Managers	Investment Operations Consultant	Actuary	Custodian	External Auditor	Internal Auditor		
Create Laws	D	O						I	I	I														
Interpret & Apply Laws		D		I							I													
Set Organizational Values			I	D				I	O															
Create Governance Structure of ERS		O	I			I		D	I	I			I	I										
Compose Rules & Regulations of ERS		O	I			I		D	I	I			I	I										
Design All Pension Benefits		O	I				I	D	I	I			I	I	I				I					
Set Employer Contribution Rates		O	I				I	D	I	I			I	I	I				I		10			
Set Employee Contribution Rates		O	I					D	I	I			I	I	I				I		10			
Set Investment Objectives		O	I				I	D	I					I	I	I								
Establish Enterprise Risk Management		O	I	O				D	I	I	I		I	I	I			I		I	10			
Create ERS Budget		O	I					D	I				I	I	I						10			
Set Risk Appetite & Risk Capacity							I	O	D					I		I								
Set Strategic Asset Allocation (SAA)								O	D					I		I								
Design Within Asset Allocation Strategies								O	D						I									
Appoint Executive Director			I	D				O																
Appoint Special Counsel			I	D				O																
Hire/Fire Auditor			I	D	I			O						I										
Adopt Investment Philosophy								O	D					I		I								
Set Performance Benchmarks								O	D					I		I								
Hire/Fire Actuary								O	D		3		3	3							10			
Hire/Fire General Investment Consultant								O	D		3		3	3							10			
Hire/Fire Investment Managers								O	D						I						10			
Hire/Fire Custodian								O	D		3		3	3	I						10			
Hire/Fire Special Consultants								O		D	4		4	4	I						10			
Appoint & Supervise DDA, CIO, CFO				O5					O5	D														
Create Annual Plan & Objectives										O				D		I								
Rebalance Fund to SAA, Tactical AA									O					D		I								
Conduct Vendor/Manager Due Diligence									O					6		D								
Size Mandates Within Constraints									O					D		I								
Sign Pension-Committee Approved Contracts										O				D							10			
Authorize Money Movements Within Fund									O					D							10			
Authorize Money Movements In/Out of Fund															D						10			
Effect Money Movements														O8	O8			D8		7	10			
Temporary CIO Back-Up & Research Assistance										O					O		D							
Report Investment Performance									O					I		O								
Measure & Report Risk									O					I		D								
Report Investment Compliance									O					I		D								
Approve CAFR				D	I				O	I	I			I	I						I	10		
Select Securities														O		I	D							
Vote Proxies														O		I	D							
Prepare Actuarial Valuation										O					O				D					
Custody Assets																				D				
Perform Master Record Keeping															O					D	10			
Audit Financial Records				O																	D	10		
Hearing of Appeals		O							D					I										
Communicate with Retirees									O	D				I	I									
Administer ERS Benefits									O	I				D							10			
Communicate with Employees on Pension									O	I	I			D	I									

- 1 Mayor has vote on the Board of Directors and Board of Trustees
- 2 Employee contribution rate decided by a majority vote of the Board of Trustees AND 2 of 3 Active Employee Trustees
- 3 Part of Proposal Selection Committee for pension/investment-related service providers excluding investment managers
- 4 May assist Executive Director in an emergency.
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- 6 CIO's due diligence proscribed in ERS Procurement Policy and focused at verifying and understanding consultant's recommendations.
- 7 Received authorized payee delegation annually from CFO to timely pay Investment Operations Consultant.
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- 9 Major benefit changes must be evaluated for impact on funding (actuarial or asset-liability study).
- 10 Internal audit checks for BOT compliance with procurement policy, ERM, Benefit Administration, and financial record integrity

"Old" Governance Matrix

ACTIONS	Delegate→																						← Reporting									
	ACTORS																															
	Governing Fiduciaries										Managing Fiduciaries						Operating Fiduciaries															
	Legislature	Courts	Mayor	S&WB Board of Directors	BOD Audit Committee	BOD Governance Committee	BOD Fin. & Admin. Committee	BOD Strategy Committee	ERS Board of Trustees	BOT Pension Committee	Executive Director	Special Counsel	Deputy Director Administration	Chief Investment Officer	Chief Financial Officer	General Consultant	Investment Managers	Investment Operations Consultant	Actuary	Custodian	External Auditor	Internal Auditor										
Create Laws	D	O						I	I	I																						
Interpret & Apply Laws		D		I				I			I																					
Set Organizational Values			I	D			I	O		I																						
Create Governance Structure of ERS		O	I			I		D	I						I																	
Compose Rules & Regulations of ERS		O	I			I		D	I			I			I																	
Design All Pension Benefits		O	I				I	O	I			I			I	I																
Set Employer Contribution Rates		O	I					D	I			I			I	I			I			10										
Set Employee Contribution Rates		O	I					D	I			I			I	I			I			10										
Set Investment Objectives		O	I				I	D	I						I	I																
Establish Enterprise Risk Management		O	I	O	I			D	I		I	I	I		I	I	I			I	I	10										
Create ERS Budget		O	I					D				I			I							10										
Set Risk Appetite & Risk Capacity																																
Set Strategic Asset Allocation (SAA)								D	I						I																	
Design Within Asset Allocation Strategies								D	I						I																	
Appoint Executive Director			I	D				O																								
Appoint Special Counsel			I	D				O																								
Hire/Fire Auditor			I	D	I			O							I																	
Adopt Investment Philosophy								D	I							I																
Set Performance Benchmarks								D	I							I																
Hire/Fire Actuary								D	I			3			3							10										
Hire/Fire General Investment Consultant								D	I			3			3							10										
Hire/Fire Investment Managers								D	I							I						10										
Hire/Fire Custodian								D	I			3			3	I						10										
Hire/Fire Special Consultants								O		D	4				4	I						10										
Appoint & Supervise DDA, CIO, CFO				O5					O5	D																						
Create Annual Plan & Objectives								O	D							I																
Rebalance Fund to SAA, Tactical AA									O							D																
Conduct Vendor/Manager Due Diligence									O							D																
Size Mandates Within Constraints									O							D																
Sign Pension-Committee Approved Contracts									O	D												10										
Authorize Money Movements Within Fund									O	D												10										
Authorize Money Movements In/Out of Fund										D												10										
Effect Money Movements														O8			D8		7			10										
Temporary CIO Back-Up & Research Assistance																D																
Report Investment Performance									O							D																
Measure & Report Risk									O							D																
Report Investment Compliance									O							D																
Approve CAFR				D	I		I		O	I	I				I						I	10										
Select Securities																O	D															
Vote Proxies																O	D															
Prepare Actuarial Valuation									O			I			I					D												
Custody Assets															O					D												
Perform Master Record Keeping															O					D		10										
Audit Financial Records				O											I						D	10										
Hearing of Appeals		O							D			I																				
Communicate with Retirees								O	D			I																				
Administer ERS Benefits								O	I			D																				
Communicate with Employees on Pension								O	I	I		D																				

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Compare "Old" Versus Proposed Governance Matrix

ACTIONS	Delegate →																			← Reporting				
	ACTORS																							
	Governing Fiduciaries										Managing Fiduciaries					Operating Fiduciaries								
	Legislature	Courts	Mayor	IS&WB Board of Directors	BOD Audit Committee	BOD Governance Committee	BOD Fin. & Admin. Committee	BOD Strategy Committee	ERS Board of Trustees	BOT Pension Committee	Executive Director	Special Counsel	Deputy Director Administration	Chief Investment Officer	Chief Financial Officer	General Consultant	Investment Managers	Investment Operations Consultant	Actuary	Custodian	External Auditor	Internal Auditor		
Create Laws	D																							
Interpret & Apply Laws		D																						
Set Organizational Values			1	D																				
Create Governance Structure of ERS			1					D																
Compose Rules & Regulations of ERS			1					D																
Design All Pension Benefits			1					D9																
Set Employer Contribution Rates			1					D																
Set Employee Contribution Rates			1					D2																
Set Investment Objectives			1					D																
Establish Enterprise Risk Management			1					D																
Create ERS Budget			1					D																
Set Risk Appetite & Risk Capacity									D															
Set Strategic Asset Allocation (SAA)								D	D															
Design Within Asset Allocation Strategies								D	D															
Appoint Executive Director			1	D																				
Appoint Special Counsel				D																				
Hire/Fire Auditor			1	D																				
Adopt Investment Philosophy								D	D															
Set Performance Benchmarks								D	D															
Hire/Fire Actuary								D	D															
Hire/Fire General Investment Consultant								D	D															
Hire/Fire Investment Managers								D	D															
Hire/Fire Custodian								D	D															
Hire/Fire Special Consultants										D														
Appoint & Supervise DDA, CIO, CFO										D														
Create Annual Plan & Objectives										D			D											
Rebalance Fund to SAA, Tactical AA												D			D									
Conduct Vendor/Manager Due Diligence													D			D								
Size Mandates Within Constraints													D			D								
Sign Pension-Committee Approved Contracts										D			D											
Authorize Money Movements Within Fund										D			D											
Authorize Money Movements In/Out of Fund										D				D										
Effect Money Movements																	D8							
Temporary CIO Back-Up & Research Assistance																D								
Report Investment Performance																D								
Measure & Report Risk																D								
Report Investment Compliance																D								
Approve CAFR				D																				
Select Securities																	D							
Vote Proxies																	D							
Prepare Actuarial Valuation																		D						
Custody Assets																			D					
Perform Master Record Keeping																				D				
Audit Financial Records																					D			
Hearing of Appeals									D															
Communicate with Retirees									D															
Administer ERS Benefits													D											
Communicate with Employees on Pension													D											

Old
New

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Home > News > Research > US Public Pensions' Funded Status Falls to 71.4% in Q1

Research May 18, 2018

US Public Pensions' Funded Status Falls to 71.4% in Q1

Milliman reports a 1.7% drop in the funded ratio of US DB plans from the end of 2017.



Volatile equity markets are being blamed for a decline in the funded status of the 100 largest US public defined benefit pension plans during the first quarter of the year. The funded status dropped to 71.4% from 73.1% at the end of the previous quarter.

According to consulting and actuarial firm Milliman's Public Pension Funding Index (PPFI), the 100 largest public defined benefit pension plans had a \$93 billion loss in funding during the first quarter, as the aggregate investment returns for the

plans were down 0.75%.

This is a reversal of fortune from the last quarter of 2017, when the funds took in investment income of approximately \$126 billion. This aggregate investment return of 3.24% raised their funded status to 73.1% from 71.6% at the end of the third quarter of last year.

“After more than a year of running smoothly, the market stubbed its toe in Q1,” Becky Sielman, author of the Milliman 100 Public Pension Funding Index, said in a release. “As a result, much of last year’s robust pension funding gains were washed away in early 2018.”

During the quarter, the estimated returns ranged from a loss of 1.91% at the low end, to a loss of 0.03% at the high end, as the Milliman 100 PPF Index deficit grew to \$1.425 trillion from \$1.332 trillion. According to Milliman, the losses resulted in six plans dropping below the 90% funded mark, with only 15 plans now above that watermark, down from 21 as of the fourth quarter of 2017. At the same time, 26 of the 100 plans now have funded ratios below the critical status threshold of 60%, with 10 plans that are less than 40% funded.

The aggregate asset value of the pension funds decreased to \$3.560 trillion at the end of Q1 from \$3.615 trillion at the end of Q4. The plans lost an investment market value of approximately \$27 billion on top of approximately \$28 billion of outflows, as benefits paid out exceeded contributions coming in from employers and plan members.

Meanwhile, the total pension liability increased to an estimated \$4.985 trillion at the end of Q1 from \$4.947 trillion at the end of Q4.

“Just as pension assets grow over time with investment income and shrink over time as benefits are paid, so too does the [total pension liability] grow over time with interest and shrink as

benefits are paid,” said Milliman in a release. “The TPL also grows as active members accrue pension benefits.”

Tags: [Defined Benefit Plan](#), [Milliman](#), [pension](#), [public pension](#), [Q1 2018](#)

By [Michael Katz](#)

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EMPLOYEES' RETIREMENT SYSTEM OF THE
SEWERAGE AND WATER BOARD OF NEW ORLEANS

HYPOTHETICAL ACCUMULATION OF "CLOSED" 15 YEAR AMORTIZATION PAYMENTS
AT VALUATION INTEREST OF 7% ANNUALLY

Year	Beginning Value	Total Payments During Year	Investment Earnings	Ending Value
1	0	7,932,566	161,872	7,673,993
2	7,673,993	7,932,566	699,051	15,885,165
3	15,885,165	7,932,566	1,273,833	24,671,119
4	24,671,119	7,932,566	1,888,850	34,072,090
5	34,072,090	7,932,566	2,546,918	44,131,129
6	44,131,129	7,932,566	3,251,051	54,894,301
7	54,894,301	7,932,566	4,004,473	66,410,895
8	66,410,895	7,932,566	4,810,634	78,733,650
9	78,733,650	7,932,566	5,673,227	91,918,998
10	91,918,998	7,932,566	6,596,201	106,027,320
11	106,027,320	7,932,566	7,598,499	121,558,385
12	121,558,385	7,932,566	8,685,674	138,176,625
13	138,176,625	7,932,566	9,848,951	155,958,142
14	155,958,142	7,932,566	11,093,657	174,984,365
15	174,984,365	7,932,566	12,425,493	195,342,424

HYPOTHETICAL ACCUMULATION OF "OPEN" 30 YEAR AMORTIZATION PAYMENTS
AT VALUATION INTEREST OF 7% ANNUALLY

Year	Beginning Value	Total Payments During Year	Investment Earnings	Ending Value
1	0	5,822,297	161,872	5,984,169
2	5,984,169	5,822,297	580,763	12,387,229
3	12,387,229	5,822,297	1,028,978	19,238,504
4	19,238,504	5,822,297	1,508,567	26,569,368
5	26,569,368	5,822,297	2,021,727	34,413,392
6	34,413,392	5,822,297	2,570,809	42,806,498
7	42,806,498	5,822,297	3,158,326	51,787,121
8	51,787,121	5,822,297	3,786,970	61,396,388
9	61,396,388	5,822,297	4,459,619	71,678,304
10	71,678,304	5,822,297	5,179,353	82,679,954
11	82,679,954	5,822,297	5,949,468	94,451,719
12	94,451,719	5,822,297	6,773,492	107,047,508
13	107,047,508	5,822,297	7,655,197	120,525,002
14	120,525,002	5,822,297	8,598,622	134,945,921
15	134,945,921	5,822,297	9,608,086	150,376,304

Notes:

Additional payments for each of 15 years, assumed payable monthly:
\$7,732,566 - \$5,822,297 = \$2,110,269

Accumulated value of additional payments at end of 15 years at 7%
valuation interest: \$195,342,424 - \$150,376,304 = \$44,966,120

Unfunded accrued actuarial liability as of 1/1/2018: \$74,538,805

Remaining unfunded accrued actuarial liability:
After 15 years: After 30 years:

15 Year Closed Amortization:	zero	zero
30 Year Open Amortization:	\$63,536,877	\$54,167,350

Sewerage and Water Board of New Orleans
December 31, 2017 Actuarial Valuation
Amortization of Unfunded Actuarial Liability
Using Open vs. Closed Amortization Periods

Elapsed Years	Interest Rate	Percentage Paid Off Under Each Amortization Method			
		10 Year Open	30 Year Open	10 Year Closed	30 Year Closed
1	.0700	7.24%	1.06%	7.24%	1.06%
2	.0700	13.95%	2.11%	14.98%	2.19%
3	.0700	20.18%	3.14%	23.27%	3.40%
4	.0700	25.96%	4.17%	32.14%	4.70%
5	.0700	31.32%	5.18%	41.62%	6.09%
6	.0700	36.29%	6.19%	51.77%	7.57%
7	.0700	40.90%	7.18%	62.64%	9.16%
8	.0700	45.18%	8.16%	74.26%	10.86%
9	.0700	49.14%	9.13%	86.69%	12.68%
10	.0700	52.82%	10.10%	100.00%	14.63%
11	.0700	56.24%	11.05%	100.00%	16.71%
12	.0700	59.41%	11.99%	100.00%	18.94%
13	.0700	62.34%	12.92%	100.00%	21.32%
14	.0700	65.07%	13.84%	100.00%	23.87%
15	.0700	67.60%	14.76%	100.00%	26.60%
16	.0700	69.94%	15.66%	100.00%	29.52%
17	.0700	72.12%	16.55%	100.00%	32.65%
18	.0700	74.14%	17.43%	100.00%	35.99%
19	.0700	76.01%	18.31%	100.00%	39.57%
20	.0700	77.75%	19.17%	100.00%	43.40%
21	.0700	79.36%	20.03%	100.00%	47.50%
22	.0700	80.85%	20.88%	100.00%	51.88%
23	.0700	82.24%	21.71%	100.00%	56.57%
24	.0700	83.52%	22.54%	100.00%	61.59%
25	.0700	84.71%	23.36%	100.00%	66.96%
26	.0700	85.82%	24.17%	100.00%	72.70%
27	.0700	86.85%	24.98%	100.00%	78.85%
28	.0700	87.80%	25.77%	100.00%	85.43%
29	.0700	88.68%	26.56%	100.00%	92.47%
30	.0700	89.50%	27.33%	100.00%	100.00%

Summary:

15 Year Closed amortization would entail an additional \$2.1 million for 15 years as compared to \$5.8 million indefinitely into the future under 30 year open amortization, with gradual reductions in the \$5.8 million annually over time. The result would be a an unfunded liability which would decrease *very gradually* from about \$74.5 million on 1/1/2018 to about \$63.5 million after fifteen years and to about \$54 million after 30 years.

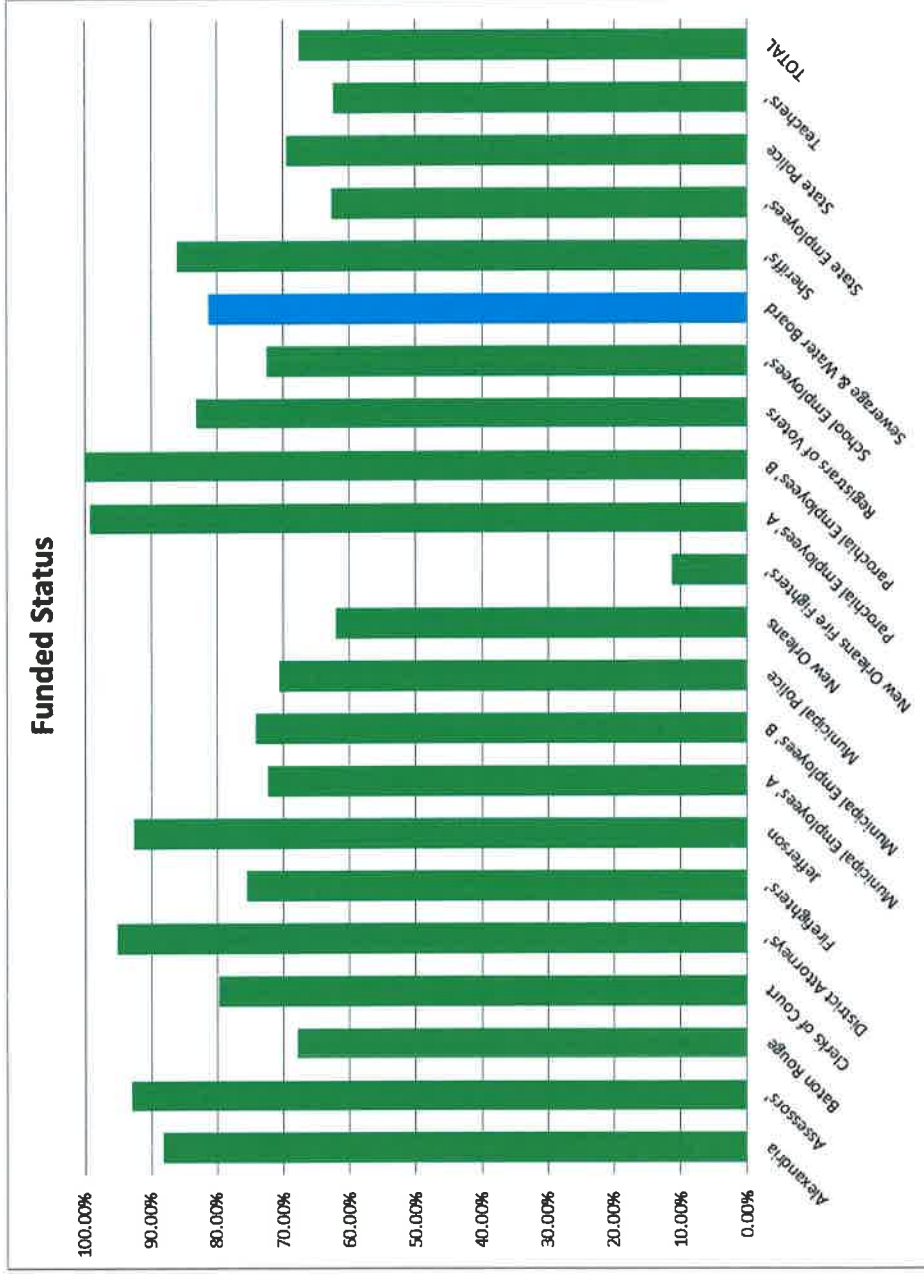
Sewerage & Water Board of New Orleans



2016 LAPERS Comparison

June 13, 2018

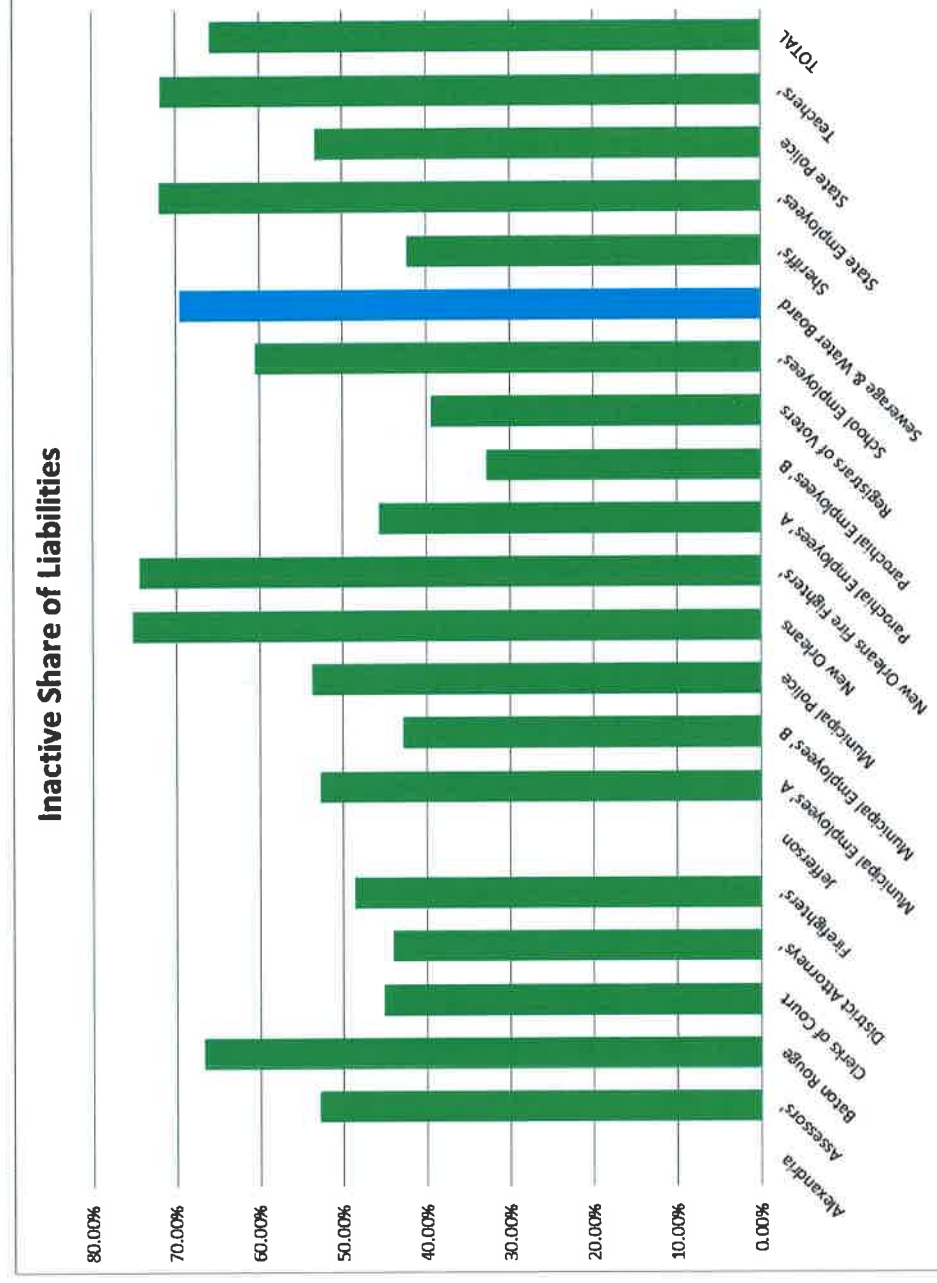
ERS/S&WB is better funded than the national and state average, but it is still unfunded.



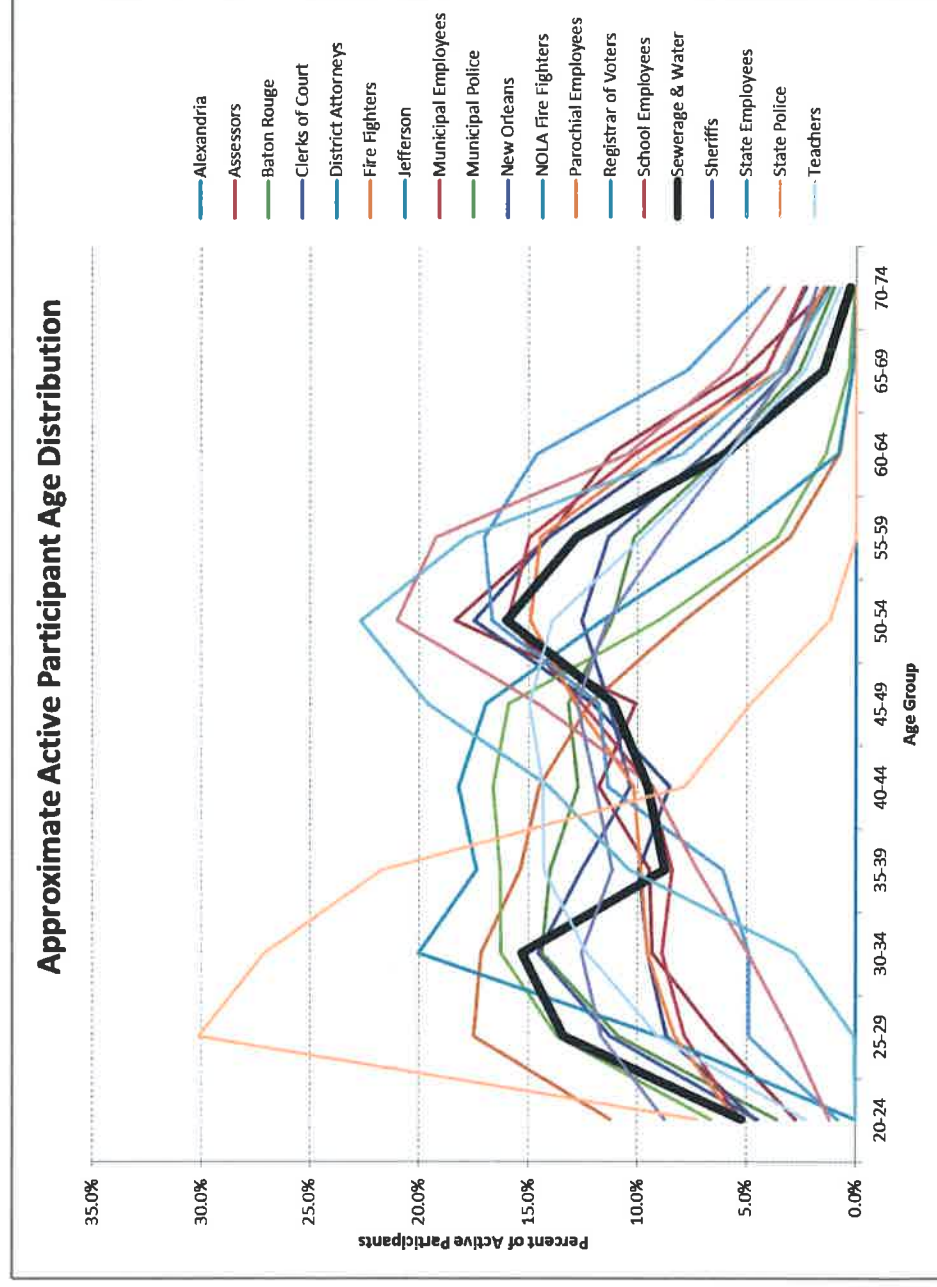
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The share of promised benefits to retirees is higher and thus ERS/S&WB has less risk capacity



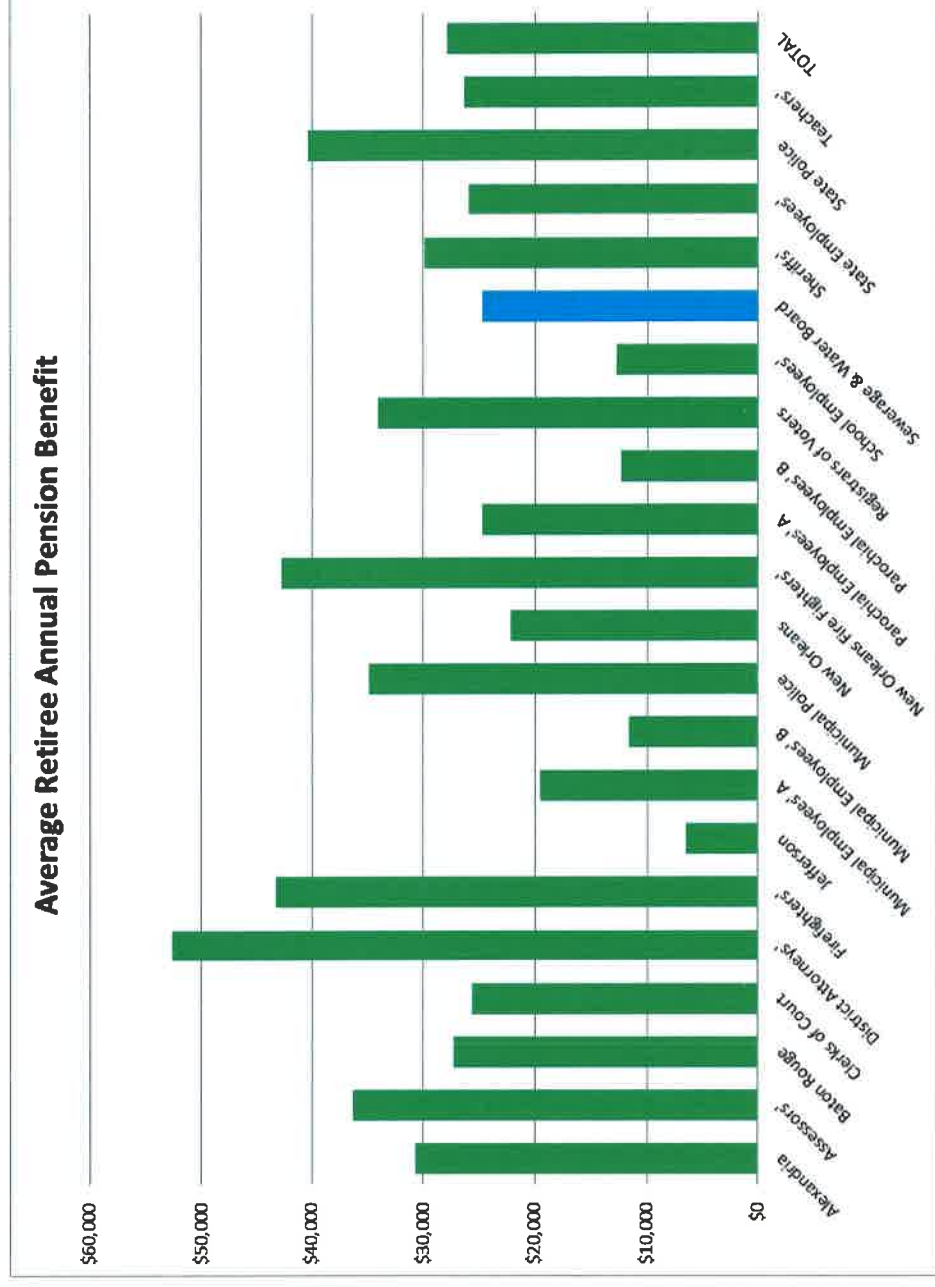
ERS/S&WB Has a Different Demographic Profile



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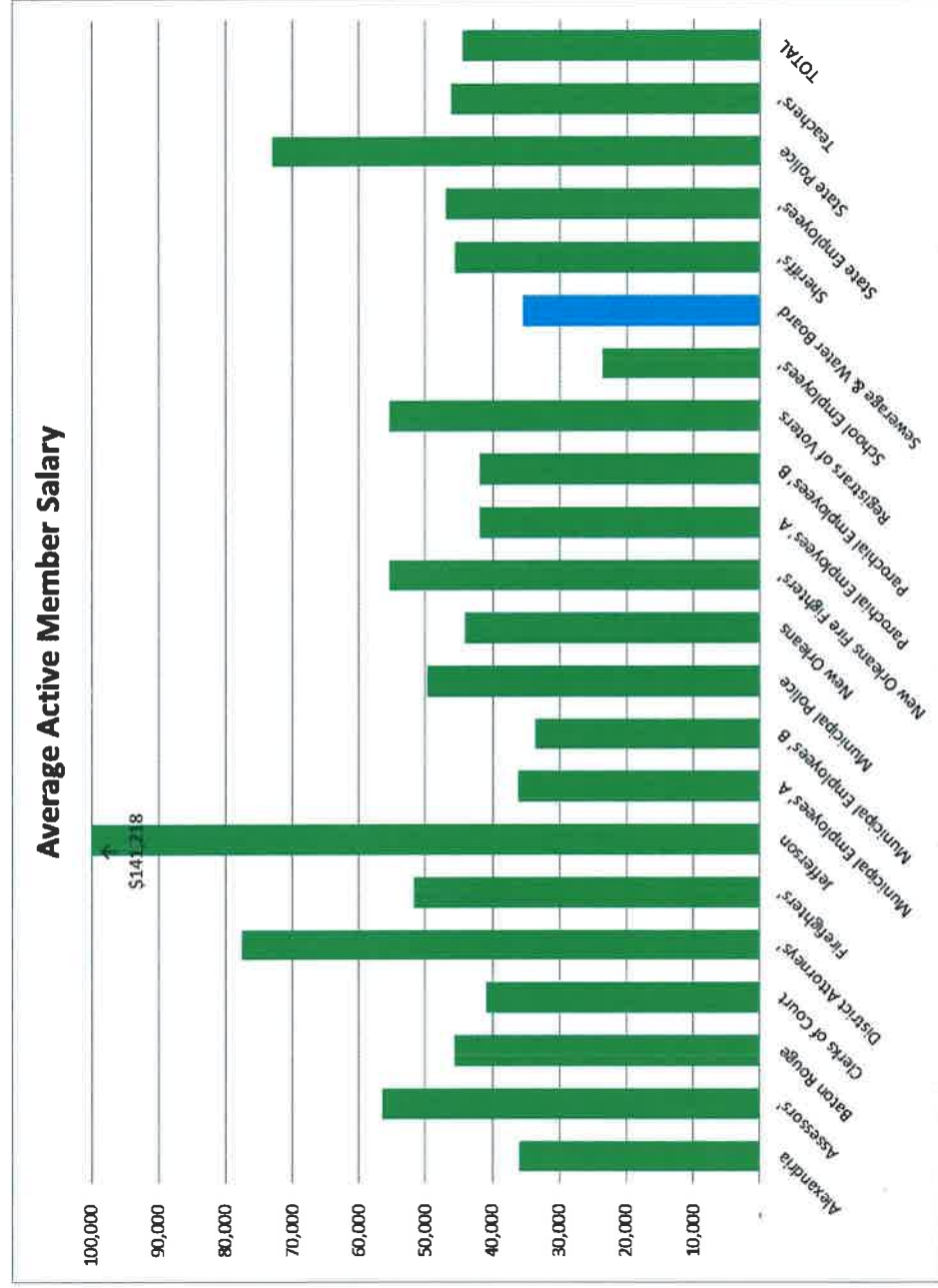
ERS/S&WB retiree benefits are lower than the state average



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Pensions are lower despite higher accrual rates because salaries are lower



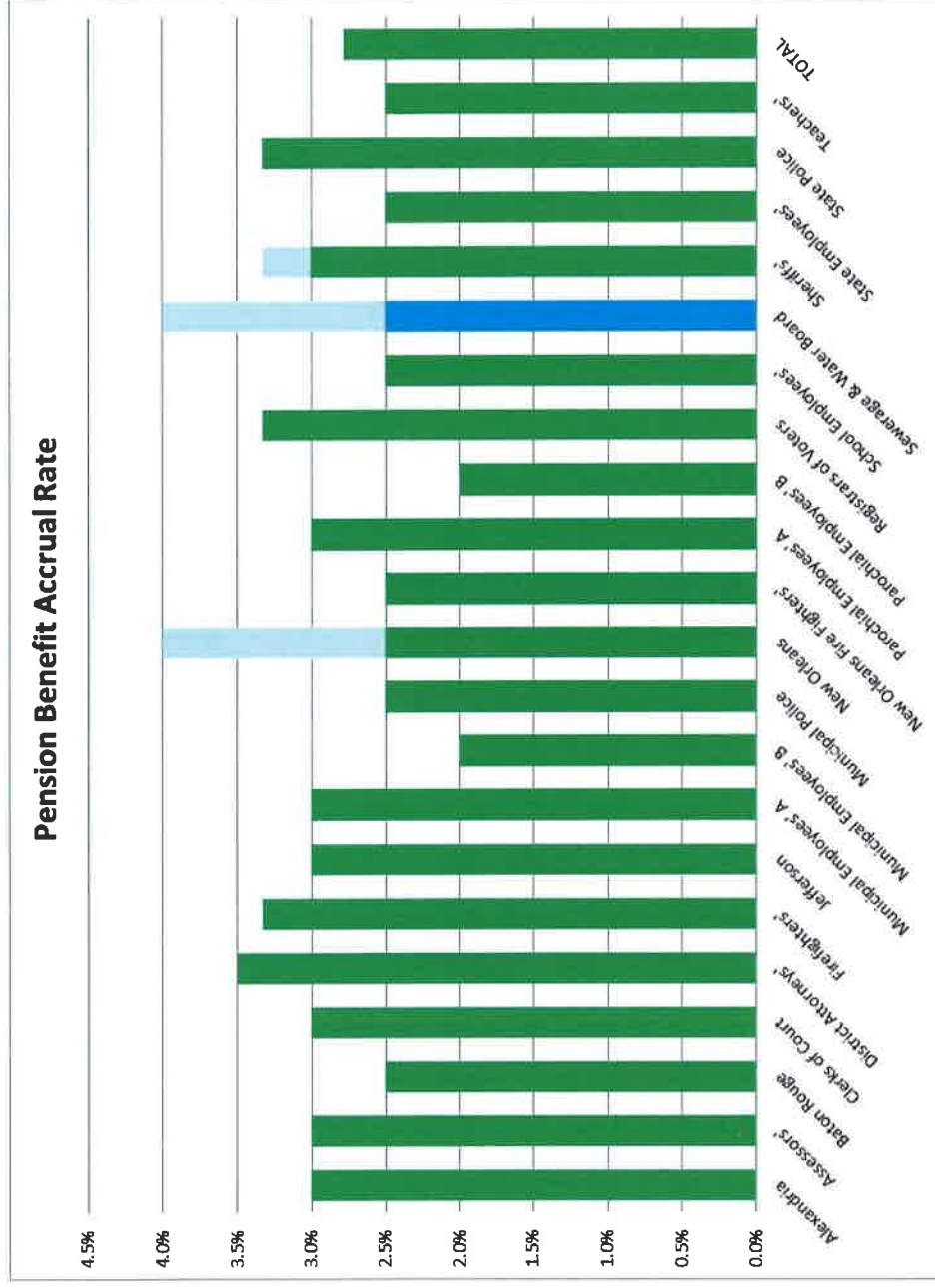
According to BLS the annual mean wage for workers in NAICS Water, Sewerage & Other Systems was \$50,910 in 2016.



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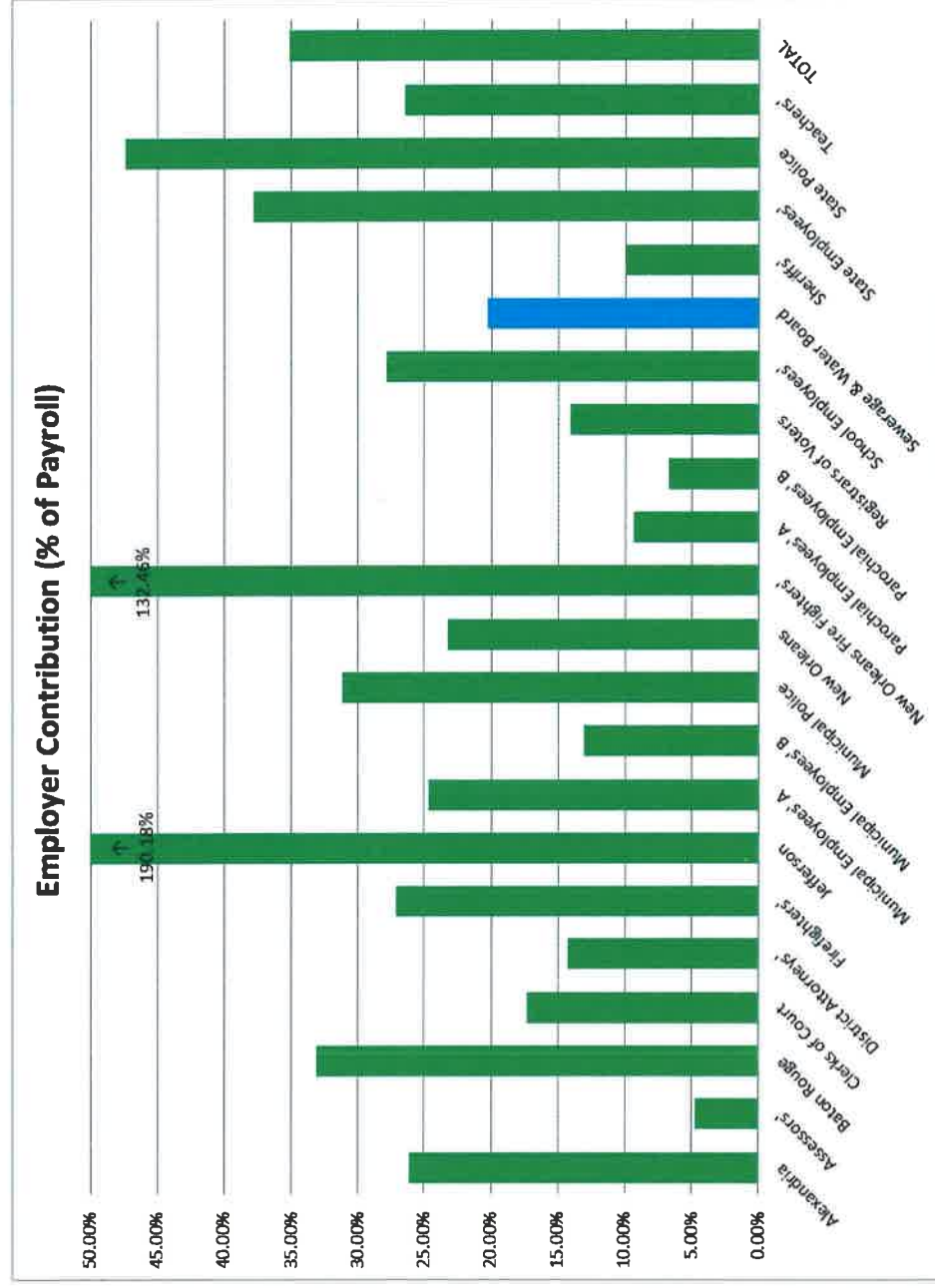
Over a 30-year service, ERS/S&WB's accrual rate is about in line with the state average



Sewerage & Water Board of New Orleans

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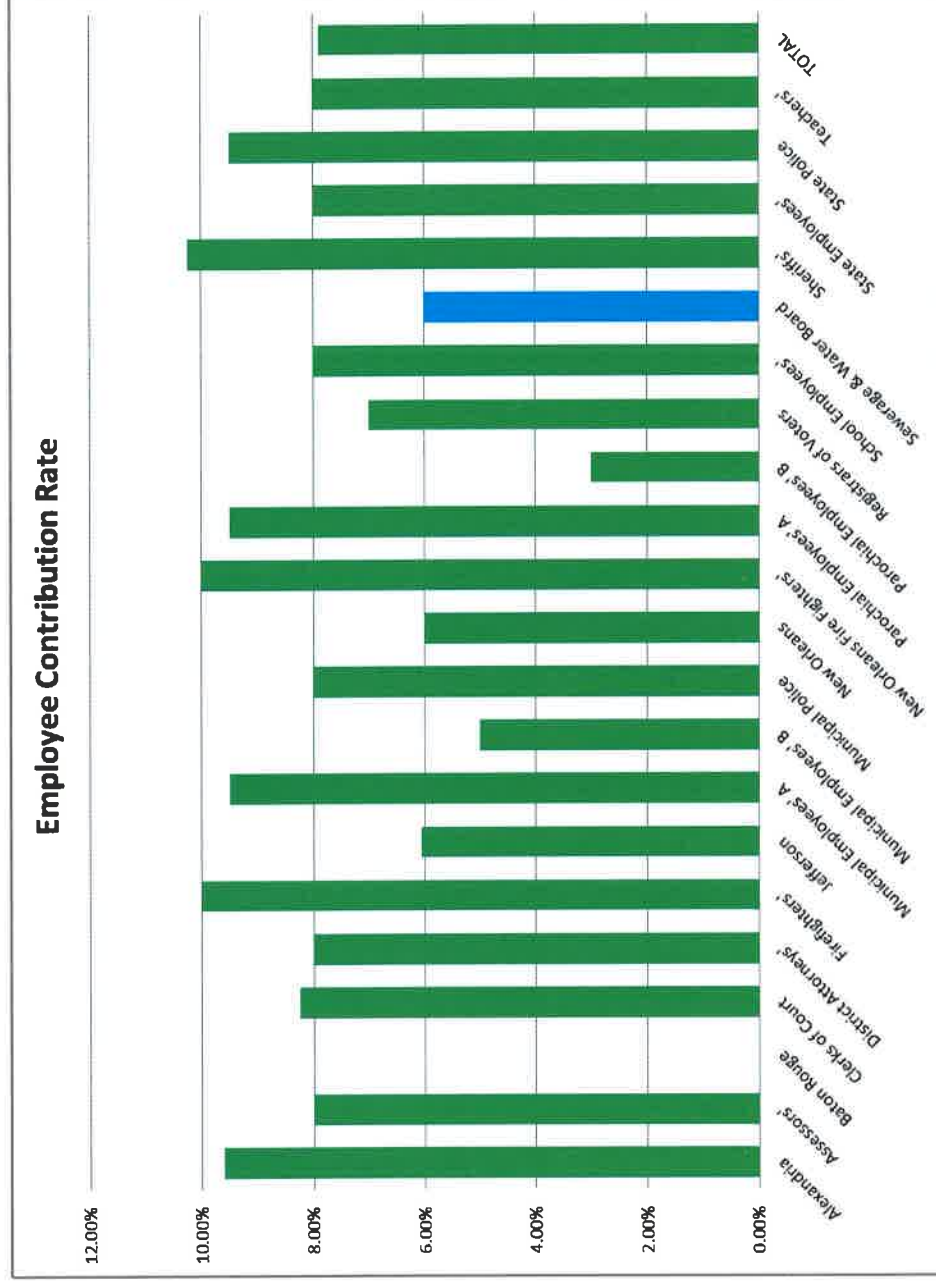
S&WB's employer contribution is below the state average



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Unlike S&WB, most Louisiana state public employees don't pay into Social Security



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<http://swbno.org>

Sewerage & Water Board of New Orleans



Re-Building the City's Water Systems for the 21st Century



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States Turbocharge Stress Testing to Sharpen Pension Policies

By Fola Akinnibi May 31, 2018

Traditionally, pensions use stress tests to see how certain portfolios react to market events and guide portfolio construction and asset allocation decisions, but a few states are going a step further, mandating more complex tests that measure how returns can affect government finances and in some cases, using the results to overhaul systems.

States like California, Colorado, Connecticut, Hawaii, New Jersey, Virginia and Washington have all recently passed legislation mandating the more complex pension stress testing standards, according to a May study by **The Pew Charitable Trusts**. More specifically, the tests take various investment return scenarios and combine them with actuarial projections, capital market assumptions, state revenue and economic forecasts and the government's funding policy to take a snapshot of the pension's health.

These tests can help pensions, and ultimately the governments backing them, understand the long-term costs of the plan, says **Greg Mennis**, a director of public sector retirement systems at the **Pew Charitable Trusts**. Many states face the risk of insolvency as their pension costs rise, meaning they must go beyond investment-focused tests, which Mennis says are a matter of course, for a complete picture.

"This is not an academic exercise... What we have done goes beyond existing actuarial projections," says Mennis, who co-authored the study. "More than anything it's intended to help state officials better understand and plan for the next recession."

Interest in stress testing comes amid a "cultural revolution" that has acknowledged forward-looking risk management as necessary for pensions, says **Carlo Acerbi**, head of risk management research for MSCI. After the financial crisis, regulators mandated the tests for banks and certain asset managers. Although pensions don't fall under this regime, it has become a common practice, he says.

"Stress tests have become [a] more and more necessary ingredient for risk management in any situation," says Acerbi. "The industry recognized that looking backward is not the only thing one should be doing when measuring financial risk."

States like North Carolina and Wisconsin don't have the mandatory stress testing requirements, but they have funding provisions in place that can increase contributions in times of financial stress, without legislation — potentially allowing them to stave off disaster. In Wisconsin, it even allows for increase benefits if investments are above a certain threshold.

Using stress tests can help move systems to these sorts of proactive policies, Mennis says. It can even push plans into complete overhauls.

For example, the Virginia Retirement System (VRS), which has run these sorts of tests for a decade and formalized its requirements in 2017, introduced a hybrid plan and etched out a funding policy thanks in part to its risk management capabilities.

Colorado, which recently passed a pension reform bill that lowers benefits and raises contributions, was also spurred on by its stress testing metrics, the report says. Like Virginia, the state has been running these tests for years but only recently put them into law.

Still, these tests are simply a guide and they aren't the sole determinant of a pension's policy, whether it be investment policy or funding policy.

"In terms of the impact of stress testing, that data is used in a way that is informational rather than directional," **Colorado Public Employees' Retirement Association** (PERA) interim executive director **Ron Baker** says, in an email. "In other words, the data help inform the Board's deliberations on assumptions but do not dictate any specific course of action."

Systems should approach the results of these tests carefully, says Max Giolitti, chief risk officer at Verus **Investments**. Baking in state economic data is ambitious, and a great thing to consider when approaching risk, he says, but it cannot be the only factor in decision making.

"The idea of looking at [macroeconomic models] is already a winner in my opinion," says Giolitti. "[But] you have to be careful. You don't want it to give you false comfort or be alarmist."

Running these tests is also a huge undertaking. The data needs to be good, and plans would need both experts in financial instruments and in economics, Giolitti says. However, it represents a step in the right direction, he adds.

Mennis says he expects even more states to adopt the standards.

"In pension policy, going from two states to seven states adopting a practice in a year may seem glacial," Mennis says. "I think it's an avalanche. We would expect that trend to continue and even accelerate."

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