

November 4, 2019

Board of Trustees
Teacher Retirement System of Texas
1000 Red River Street
Austin, TX 78701

**Subject: GASB 67 Reporting and Disclosure Information for the year ending
 August 31, 2019**

Dear Board of Trustees,

This report provides information required by the Teacher Retirement System of Texas (TRS) in connection with the Governmental Accounting Standards Board (GASB) Statement No. 67 “Financial Reporting for Pension Plans.” The information provided herein was prepared for the purpose of assisting TRS to comply with the financial reporting and disclosure requirements of GASB No. 67.

The calculation of the liability associated with the benefits described in this report was performed for the purpose of satisfying the requirements of GASB No. 67 and is not applicable for purposes of funding the plan. A calculation of the plan’s liability for other purposes may produce significantly different results. This report may be provided to parties other than TRS only in its entirety and only with the permission of TRS.

The total pension liability, net pension liability, and certain sensitivity information shown in this report are based on an actuarial valuation performed as of August 31, 2018. The total pension liability was rolled forward from the valuation date to the measurement date of August 31, 2019 using generally accepted actuarial principles. The liabilities reflect the actuarial assumptions adopted by the Board in July of 2018. It is our opinion that the assumptions are internally consistent, reasonable, and comply with the requirements under GASB No. 67. There were no significant events or changes in the benefit provisions that required an adjustment to the rolled forward liabilities.

This report is based upon information, furnished to us by TRS, which include benefit provisions, membership information, and financial data. We did not audit this data and information, but we did apply a number of tests and concluded that it was reasonable and consistent. GRS is not responsible for the accuracy or completeness of the information provided to us by TRS.

The final section of the report titled “Calculation of the Single Discount Rate” is not a required disclosure item for your financial statements. However, it is possible that your auditors will request this information which is why it is included in the report.

Certain tables included in the Required Supplementary Information should include a 10-year history of information. As provided for in GASB No. 67, this historical information is only presented for the years in which the information was measured in conformity with the requirements of GASB No. 67. The historical information in this report begins with the information presented for the fiscal year ending August 31, 2014.

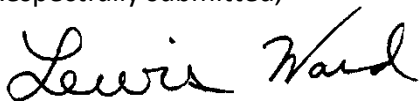
This report compliments the actuarial valuation report that was provided to TRS and should be considered together as a complete report for the plan year ending August 31, 2019. Please see the actuarial valuation report as August 31, 2018 for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions. Also, please see the experience study report dated July 27, 2018 which details the actuarial assumption used in the determination of the net pension liability. The actuarial cost method used to determine the GASB No. 67 net pension liability is the Individual Entry Age Normal method as prescribed in GASB No. 67.

The projected cash flows from the employer are based on contributions for the most recent five year period, modified on consideration of subsequent events. Changes in statute in the 2013 legislative session and the subsequent follow through are indicators that the legislature is committed to an increase in funding levels for the pension funds. Additional changes to the contribution levels were adopted in the 2019 legislative session. Based on these events, projected employer contributions are based on the contribution rates adopted by the 2019 legislature.

The actuarial methods and assumptions have been selected by the Board of Trustees of the Teacher Retirement System of Texas based upon GRS analysis and recommendations. The Board of Trustees has sole authority to determine the actuarial assumptions used for the plan. The actuarial methods and assumptions are primarily based on a study of actual experience for the three year period ending August 31, 2017 and were adopted in July 2018. The assumption change shown in the reconciliation of this year's Net Pension Liability (on page 8 of this report) is primarily due to the change in the Single Discount Rate from last year's blended rate of 6.907% to this year's long term rate of return of 7.25%. Also, included in the assumption change is an assumption about the legislated pay increases from SB 3.

To the best of our knowledge, the information contained with this report is accurate and fairly represents the actuarial position of the Teacher Retirement System of Texas. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board. Mr. Newton is a member of the American Academy of Actuaries (MAAA) and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,



Lewis Ward
Consultant



Joe Newton, FSA, EA, MAAA
Pension Market Leader and Actuary

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	420,458
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	298,498
Active Plan Members	<u>872,999</u>
Total Plan Members	1,591,955

All counts are as of the valuation date August 31, 2018

The Average Expected Remaining Service Life (AERSL) of 6.3623 is based on the membership information as of the beginning of the fiscal year. The AERSL of the active employees was 11.6020 years. This calculates to a total remaining service years of $11.6020 \times 872,999 = 10,128,534.40$ years. Divided by the total membership of 1,591,955 as of August 31, 2018 yields an AERSL of 6.3623 years.

Measurement of the Net Pension Liability

The net pension liability is measured as the total pension liability, less the amount of the pension plan's fiduciary net position. In actuarial terms, this will be the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

A single discount rate of 7.250% was used to measure the total pension liability. This single discount rate was based on the expected rate of return on pension plan investments of 7.25%. The projection of cash flows used to determine this single discount rate assumed that plan member contributions, the employer contributions, and the state contributions will be made at the rates set by the legislature during the 2019 legislative session (please see the actuarial valuation report for a description of these rates). It is assumed that future non-member contributions will be 8.50% of payroll in fiscal year 2020 gradually increasing to 9.55% of payroll over the next several fiscal years (these contributions include contributions by the State and the employers for active employees and rehired retirees).

Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all period of projected benefit payments to determine the total pension liability.

A brief summary of the primary assumptions used in the determination of the net pension liability is shown in the table on the following page.

Actuarial Assumptions - The total pension liability is determined by an actuarial valuation. The actuarial assumptions used to determine the total pension liability were based on the results of an experience study for the three-year period ending August 31, 2017. The post-retirement mortality rates for healthy lives were based on the 2018 TRS of Texas Healthy Pensioner Mortality Tables, with full generational projection using the ultimate improvement rates from the most recently published projection scale ("U-MP"). The active mortality rates were based on 90% of the RP-2014 Employee Mortality Tables for males and females, also with full generational mortality.

The following methods and assumptions were applied to this measurement period:

Valuation Date	August 31, 2018 (total pension liability rolled forward from valuation date to measurement date of August 31, 2019)
Actuarial Cost Method	Individual Entry Age Normal actuarial cost method
Asset Valuation Method	Market Value
Actuarial Assumptions:	
Single Discount Rate	7.250%
Long-term Expected Return	7.25%
Municipal Bond Rate*	2.63%
Last year ending August 31 in projection period (100 years)	2116
Inflation	2.30%
Salary Increases	3.05% to 9.05% including inflation
Ad hoc post-employment benefit changes	None

* The municipal bond rate used is 2.63% as of August 2019 (i.e. the rate closest to but not later than the Measurement Date). The source for the rate is the Fixed Income Market Data/Yield Curve/Data Municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-Year Municipal GO AA Index."

The actuarial assumptions used in the determination of the total pension liability are the same assumptions used in the actuarial valuation as of August 31, 2018. For a full description of these assumptions please see the actuarial valuation report dated November 9, 2018.

The exceptions to these assumptions are:

- The Single Discount Rate as of August 31, 2018 was a blended rate of 6.907% and that has changed to the long term rate of return of 7.25% as of August 31, 2019.
- With the enactment of SB 3 by the 2019 Legislature, an assumption has been made about how this legislation would impact future salaries. We have assumed that eligible active members would each receive a \$2,700 increase in fiscal year 2020. This is in addition to the salary increase expected based on the actuarial assumptions.

Below is a table providing the sensitivity of the net pension liability to changes in the discount rate. In particular, the table presents the plan's net pension liability, if it were calculated using a single discount rate that is 1-percentage-point lower or 1-percentage-point higher than the single discount rate:

Sensitivity of the Net Pension Liability to the Single Discount Rate Assumption

1% Decrease	Current Single Discount	1% Increase
6.250%	Rate Assumption	8.250%
7.250%		
\$79,905,616,584	\$51,983,126,213	\$29,360,519,479

Reconciliation of Fiduciary Net Position

for Year Ended August 31, 2019

	Year Ending August 31, 2019
Additions	
Contributions	
Non-Employer Contributing Entity	\$ 1,737,852,502
Employer	1,761,821,902
Employee	3,482,869,726
Other	660,822,793
Total Contributions	<u>\$ 7,643,366,923</u>
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 8,345,373,204
Interest and Dividends	0
Less Investment Expense	(676,344,330)
Net Investment Income	<u>\$ 7,669,028,874</u>
Other	<u>\$ 8,112,666</u>
Total Additions	<u>\$ 15,320,508,463</u>
Deductions	
Benefit payments, including refunds of employee contributions	\$ 11,740,189,875
Pension Plan Administrative Expense	60,485,645
Other*	110,535,701
Total Deductions	<u>\$ 11,911,211,221</u>
Net Increase (Decrease) in Net Position	<u>\$ 3,409,297,242</u>
Net Position Restricted for Pensions	
Beginning of Year	<u>\$ 154,568,901,833</u>
End of Year	<u><u>\$ 157,978,199,075</u></u>

*The \$4,268,648 prior period adjustment to the beginning of year Net Position was reflected as an "Other" addition.

Schedules of Required Supplementary Information

Schedule of Changes in the Employer's Net Pension Liability and Related Ratios

Fiscal year ending August 31,	2019	2018	2017	2016	2015	2014
Total Pension Liability						
Service Cost	\$ 5,642,074,695	\$ 4,654,171,138	\$ 4,489,045,421	\$ 4,392,076,679	\$ 4,225,448,833	\$ 3,965,994,265
Interest on the Total Pension Liability	14,267,256,072	14,109,276,321	13,515,485,995	12,896,571,424	12,555,645,919	11,813,445,940
Benefit Changes	588,827,787	0	0	-	-	-
Difference between Expected and Actual Experience	(982,693,577)	0	(969,830,844)	373,668,629	(1,588,618,832)	482,638,639
Assumption Changes	(7,425,278,607)	22,106,679,263	700,880,288	-	(1,474,723,994)	2,028,541,342
Benefit Payments	(11,253,728,973)	(10,172,997,008)	(9,775,775,472)	(9,379,122,730)	(8,935,111,459)	(8,548,642,525)
Refunds	(486,460,902)	(422,335,740)	(420,421,056)	(373,418,687)	(391,341,181)	(410,600,319)
Net Change in Total Pension Liability	\$ 349,996,495	\$ 30,274,793,974	\$ 7,539,384,332	7,909,775,315	4,391,299,286	9,331,377,342
Total Pension Liability - Beginning	\$ 209,611,328,793	\$ 179,336,534,819	\$ 171,797,150,487	163,887,375,172	159,496,075,886	150,164,698,544
Total Pension Liability - Ending (a)	\$ 209,961,325,288	\$ 209,611,328,793	\$ 179,336,534,819	\$ 171,797,150,487	\$ 163,887,375,172	\$ 159,496,075,886
Plan Fiduciary Net Position						
Non-Contributing Entity	\$ 1,737,852,502	\$ 1,715,784,550	\$ 1,697,962,608	1,675,631,248	1,591,482,988	1,530,623,829
Employer Contributions	1,761,821,902	1,671,257,303	1,588,309,345	\$ 1,483,389,348	\$ 1,377,972,653	\$ 984,552,391
Employee Contributions	3,482,869,726	3,360,773,197	3,242,556,261	2,943,669,320	2,576,024,311	2,357,686,000
Pension Plan Net Investment Income	7,669,028,874	11,242,813,657	17,079,807,347	9,193,280,560	(412,759,100)	19,434,430,034
Benefit Payments	(11,253,728,973)	(10,172,997,008)	(9,775,775,472)	(9,379,122,730)	(8,935,111,459)	(8,548,642,525)
Refunds	(486,460,902)	(422,335,740)	(420,421,056)	(373,418,687)	(391,341,181)	(410,600,319)
Pension Plan Administrative Expense	(60,485,645)	(64,926,169)	(44,189,998)	(44,402,710)	(35,556,979)	(41,904,190)
Other	558,399,758	(123,390,077)	(14,964,388)	(29,095,088)	(11,248,106)	84,954,006
Net Change in Plan Fiduciary Net Position	\$ 3,409,297,242	\$ 7,206,979,713	\$ 13,353,284,647	5,469,931,261	(4,240,536,873)	15,391,099,226
Plan Fiduciary Net Position - Beginning	\$ 154,568,901,833	\$ 147,361,922,120	\$ 134,008,637,473	128,538,706,212	132,779,243,085	117,388,143,859
Plan Fiduciary Net Position - Ending (b)	\$ 157,978,199,075	\$ 154,568,901,833	\$ 147,361,922,120	\$ 134,008,637,473	\$ 128,538,706,212	\$ 132,779,243,085
Net Pension Liability - Ending (a) - (b)	\$ 51,983,126,213	\$ 55,042,426,960	\$ 31,974,612,699	37,788,513,014	35,348,668,960	26,716,832,801
Plan Fiduciary Net Position as a Percentage						
of Total Pension Liability	75.24 %	73.74 %	82.17 %	78.00 %	78.43 %	83.25 %
Covered Employee Payroll	\$ 45,232,074,364	\$ 43,646,405,156	\$ 42,111,120,273	\$ 40,742,826,333	\$ 38,448,124,045	\$ 36,654,290,800
Net Pension Liability as a Percentage						
of Covered Employee Payroll	114.93 %	126.11 %	75.93 %	92.75 %	91.94 %	72.89 %
Notes to Schedule:						
N/A						

Schedules of Required Supplementary Information

Schedule of the Net Pension Liability (Historical)

Last 10 Fiscal Years

FY Ending August 31,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll	Net Pension Liability as a % of Covered Payroll
2013	\$ 150,164,698,544	\$ 117,388,143,859	\$ 32,776,554,685	78.17%	\$ 35,188,983,344	93.14%
2014	159,496,075,886	132,779,243,085	26,716,832,801	83.25%	36,654,290,800	72.89%
2015	163,887,375,172	128,538,706,212	35,348,668,960	78.43%	38,448,124,045	91.94%
2016	171,797,150,487	134,008,637,473	37,788,513,014	78.00%	40,742,826,333	92.75%
2017	179,336,534,819	147,361,922,120	31,974,612,699	82.17%	42,111,120,273	75.93%
2018	209,611,328,793	154,568,901,833	55,042,426,960	73.74%	43,646,405,156	126.11%
2019	209,961,325,288	157,978,199,075	51,983,126,213	75.24%	45,232,074,364	114.93%

SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Contributions

FY Ending August 31,	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
2014	\$3,177,927,012	\$2,515,176,220	662,750,792	36,654,290,800	6.86%
2015	3,171,970,234	2,969,455,641	202,514,593	38,448,124,045	7.72%
2016	3,226,831,846	3,159,020,596	67,811,250	40,742,826,333	7.75%
2017	3,343,622,950	3,286,271,953	57,350,997	42,111,120,273	7.80%
2018	3,426,242,805	3,387,041,853	39,200,952	43,646,405,156	7.76%
2019	4,288,000,650	3,499,674,404	788,326,246	45,232,074,364	7.74%

Notes to Schedule of Contributions

Valuation Date: August 31, 2018 (to determine contribution rate for fiscal year ending August 31, 2019).

Notes: Actuarially determined contribution rates are calculated as of August 31 preceding fiscal year. Members and employers contribute based on statutorily fixed rates.

Methods and Assumptions Used to Determine Contribution Rates:

Actuarial Cost Method	Individual Entry Age Normal actuarial cost method
Amortization Method	Level Percentage of Payroll, Floating
Remaining Amortization Period	87 years based on rates contributed during fiscal year. 30 based on increased employer and member rates to begin Sept 1, 2019 from 2019 legislative session .
Asset Valuation Method	5 Year smoothed market
Inflation	2.30%
Salary Increases	3.05% to 9.05% including inflation
Investment Rate of Return	7.25%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2018 valuation pursuant to an experience study conducted for the period ending on August 31, 2017.
Mortality	The post-retirement mortality rates for healthy lives were based on the 2018 TRS of Texas Healthy Pensioner Mortality Tables, with full generational projection using the ultimate improvement rates from the most recently published projection scale ("U-MP"). The active mortality rates were based on 90% of the RP-2014 Employee Mortality Tables for males and females, also with full generational mortality.

Other Information:

Notes A 13th check was paid during the fiscal year. A supplemental contribution equal to the 13th check was also made during the fiscal year. Future member contribution rates were also increased.

The assumptions used to determine the ADEC are those in effect for the August 31, 2018 actuarial valuation. Due to the lag between valuation date and the measurement date, they may not be the same as the assumptions used to measure the Net Pension Liability.

Calculation of the Single Discount Rate

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the assumed valuation discount rate is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a municipal bond rate is required, as described in the following paragraph.

The *single discount rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.25%; the municipal bond rate is 2.630% (based on the daily rate closest to but not later than the measurement date of the Fidelity “20-Year Municipal GO AA Index”); and the resulting single discount rate is 7.250%.

The tables in this section provide background for the development of the single discount rate.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities).

The **Projection of Plan Fiduciary Net Position** table shows the development of expected asset levels in future years.

The **Present Values of Projected Benefit Payments** table shows the development of the Single Discount Rate (SDR). It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR.

Single Discount Rate Development

Projection of Contributions Beginning September 1, 2019

Year	Payroll for Current Employees	Payroll for Future Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for All Employees	Employer Normal Cost Contributions Related to Payroll of Future Employees	Total Contributions
1	40,667,679,594	\$ 5,921,357,001	46,589,036,595	3,131,411,329	3,960,068,111	(246,731,929)	6,844,747,511
2	39,235,147,432	8,751,560,261	47,986,707,692	3,021,106,352	4,107,662,178	(358,084,611)	6,770,683,919
3	37,926,441,769	11,499,867,154	49,426,308,923	3,034,115,342	4,389,056,232	(430,340,160)	6,992,831,414
4	36,679,368,184	14,229,730,006	50,909,098,191	2,934,349,455	4,678,546,124	(525,899,478)	7,086,996,101
5	35,488,751,049	16,947,620,087	52,436,371,137	2,927,821,962	4,981,455,258	(576,498,436)	7,332,778,784
6	34,329,802,696	19,679,659,574	54,009,462,271	2,832,208,722	5,157,903,647	(661,238,957)	7,328,873,412
7	33,179,118,227	22,450,627,912	55,629,746,139	2,737,277,254	5,312,640,756	(745,496,024)	7,304,421,986
8	32,015,892,481	25,282,746,042	57,298,638,523	2,641,311,130	5,472,019,979	(830,040,447)	7,283,290,662
9	30,829,284,029	28,188,313,650	59,017,597,679	2,543,415,932	5,636,180,578	(915,288,937)	7,264,307,573
10	29,611,297,374	31,176,828,235	60,788,125,609	2,442,932,033	5,805,265,996	(1,001,429,782)	7,246,768,247
11	28,351,982,049	34,259,787,329	62,611,769,377	2,339,038,519	5,979,423,976	(1,088,973,425)	7,229,489,070
12	27,070,508,929	37,419,613,529	64,490,122,459	2,233,316,987	6,158,806,695	(1,177,507,282)	7,214,616,400
13	25,766,076,862	40,658,749,270	66,424,826,132	2,125,701,341	6,343,570,896	(1,266,959,464)	7,202,312,773
14	24,440,501,737	43,977,069,180	68,417,570,916	2,016,341,393	6,533,878,023	(1,357,487,911)	7,192,731,505
15	23,097,171,036	47,372,927,008	70,470,098,044	1,905,516,610	6,729,894,363	(1,448,999,107)	7,186,411,866
16	21,752,765,237	50,831,435,749	72,584,200,985	1,794,603,132	6,931,791,194	(1,541,249,104)	7,185,145,222
17	20,423,103,572	54,338,623,442	74,761,727,015	1,684,906,045	7,139,744,930	(1,633,921,358)	7,190,729,617
18	19,142,177,384	57,862,401,441	77,004,578,825	1,579,229,634	7,353,937,278	(1,726,198,352)	7,206,968,560
19	17,928,618,599	61,386,097,591	79,314,716,190	1,479,111,034	7,574,555,396	(1,817,694,775)	7,235,971,655
20	16,767,004,583	64,927,153,092	81,694,157,676	1,383,277,878	7,801,792,058	(1,909,042,099)	7,276,027,837
21	15,658,811,141	68,486,171,265	84,144,982,406	1,291,851,919	8,035,845,820	(2,000,420,650)	7,327,277,089
22	14,593,349,315	72,075,982,563	86,669,331,878	1,203,951,318	8,276,921,194	(2,092,281,351)	7,388,591,161
23	13,561,702,432	75,707,709,402	89,269,411,834	1,118,840,451	8,525,228,830	(2,185,192,105)	7,458,877,176
24	12,554,035,058	79,393,459,131	91,947,494,189	1,035,707,892	8,780,985,695	(2,279,716,324)	7,536,977,263
25	11,566,574,774	83,139,344,241	94,705,919,015	954,242,419	9,044,415,266	(2,376,292,482)	7,622,365,203
26	10,586,573,917	86,960,522,668	97,547,096,586	873,392,348	9,315,747,724	(2,475,772,208)	7,713,367,864
27	9,626,250,389	90,847,259,094	100,473,509,483	794,165,657	9,595,220,156	(2,577,955,437)	7,811,430,376
28	8,698,747,748	94,788,967,020	103,487,714,768	717,646,689	9,883,076,760	(2,682,453,349)	7,918,270,100
29	7,809,314,060	98,783,032,151	106,592,346,211	644,268,410	10,179,569,063	(2,789,141,728)	8,034,695,745
30	6,954,201,652	102,835,914,945	109,790,116,597	573,721,636	10,484,956,135	(2,898,479,234)	8,160,198,537
31	6,113,960,964	106,969,859,131	113,083,820,095	504,401,780	10,799,504,819	(3,011,646,054)	8,292,260,545
32	5,295,946,913	111,180,387,784	116,476,334,698	436,915,620	11,123,489,964	(3,130,189,933)	8,430,215,651
33	4,512,785,031	115,457,839,708	119,970,624,739	372,304,765	11,457,194,663	(3,250,617,980)	8,578,881,448
34	3,769,951,049	119,799,792,432	123,569,743,481	311,020,962	11,800,910,502	(3,372,861,992)	8,739,069,472
35	3,082,138,878	124,194,696,907	127,276,835,785	254,276,457	12,154,937,817	(3,496,596,817)	8,912,617,457
36	2,464,586,394	128,630,554,464	131,095,140,859	203,328,378	12,519,585,952	(3,621,484,640)	9,101,429,690
37	1,923,272,912	133,104,722,173	135,027,995,084	158,670,015	12,895,173,531	(3,747,451,054)	9,306,392,492
38	1,470,231,186	137,608,603,751	139,078,834,937	121,294,073	13,282,028,736	(3,874,254,037)	9,529,068,772
39	1,111,114,335	142,140,085,650	143,251,199,985	91,666,933	13,680,489,599	(4,001,834,083)	9,770,322,449
40	831,042,606	146,717,693,378	147,548,735,985	68,561,015	14,090,904,287	(4,130,712,763)	10,028,752,539
41	611,843,042	151,363,355,023	151,975,198,064	50,477,051	14,513,631,415	(4,261,507,444)	10,302,601,022
42	445,292,563	156,089,161,443	156,534,454,006	36,736,636	14,949,040,358	(4,394,558,533)	10,591,218,461
43	318,836,730	160,911,650,896	161,230,487,626	26,304,030	15,397,511,568	(4,530,331,651)	10,893,483,947
44	222,871,503	165,844,530,752	166,067,402,255	18,386,899	15,859,436,915	(4,669,212,718)	11,208,611,096
45	150,603,003	170,898,821,320	171,049,424,323	12,424,748	16,335,220,023	(4,811,512,001)	11,536,132,770
46	96,895,051	176,084,012,002	176,180,907,052	7,993,842	16,825,276,624	(4,957,496,666)	11,875,773,800
47	58,470,978	181,407,863,287	181,466,334,264	4,823,856	17,330,034,922	(5,107,385,203)	12,227,473,575
48	32,365,193	186,877,959,099	186,910,324,292	2,670,128	17,849,935,970	(5,261,391,132)	12,591,214,966
49	15,511,718	192,502,122,302	192,517,634,021	1,279,717	18,385,434,049	(5,419,734,697)	12,966,979,069

Single Discount Rate Development

Projection of Contributions Beginning September 1, 2019(continued)

Year	Payroll for Current Employees	Payroll for Future Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for All Employees	Employer Normal Cost Contributions Related to Payroll of Future Employees	Total Contributions
50	6,117,518	198,287,045,523	198,293,163,041	504,695	18,936,997,070	(5,582,604,326)	13,354,897,439
51	2,226,679	204,239,731,253	204,241,957,933	183,701	19,505,106,983	(5,750,197,166)	13,755,093,518
52	950,846	210,368,265,824	210,369,216,671	78,445	20,090,260,192	(5,922,740,881)	14,167,597,756
53	336,583	216,679,956,588	216,680,293,171	27,768	20,692,967,998	(6,100,441,205)	14,592,554,561
54	86,492	223,180,615,474	223,180,701,966	7,136	21,313,757,038	(6,283,461,766)	15,030,302,408
55	12,558	229,876,110,467	229,876,123,025	1,036	21,953,169,749	(6,471,967,774)	15,481,203,011
56	1,224	236,772,405,491	236,772,406,716	101	22,611,764,841	(6,666,127,137)	15,945,637,805
57	-	243,875,578,917	243,875,578,917	-	23,290,117,787	(6,866,110,987)	16,424,006,800
58	-	251,191,846,285	251,191,846,285	-	23,988,821,320	(7,072,094,316)	16,916,727,004
59	-	258,727,601,673	258,727,601,673	-	24,708,485,960	(7,284,257,146)	17,424,228,814
60	-	266,489,429,723	266,489,429,723	-	25,449,740,539	(7,502,784,860)	17,946,955,679
61	-	274,484,112,615	274,484,112,615	-	26,213,232,755	(7,727,868,406)	18,485,364,349
62	-	282,718,635,993	282,718,635,993	-	26,999,629,737	(7,959,704,458)	19,039,925,279
63	-	291,200,195,073	291,200,195,073	-	27,809,618,629	(8,198,495,592)	19,611,123,037
64	-	299,936,200,925	299,936,200,925	-	28,643,907,188	(8,444,450,460)	20,199,456,728
65	-	308,934,286,953	308,934,286,953	-	29,503,224,404	(8,697,783,973)	20,805,440,431
66	-	318,202,315,562	318,202,315,562	-	30,388,321,136	(8,958,717,493)	21,429,603,643
67	-	327,748,385,029	327,748,385,029	-	31,299,970,770	(9,227,479,017)	22,072,491,753
68	-	337,580,836,579	337,580,836,579	-	32,238,969,893	(9,504,303,388)	22,734,666,505
69	-	347,708,261,677	347,708,261,677	-	33,206,138,990	(9,789,432,489)	23,416,706,501
70	-	358,139,509,527	358,139,509,527	-	34,202,323,160	(10,083,115,464)	24,119,207,696
71	-	368,883,694,813	368,883,694,813	-	35,228,392,855	(10,385,608,928)	24,842,783,927
72	-	379,950,205,657	379,950,205,657	-	36,285,244,640	(10,697,177,196)	25,588,067,444
73	-	391,348,711,827	391,348,711,827	-	37,373,801,979	(11,018,092,512)	26,355,709,467
74	-	403,089,173,182	403,089,173,182	-	38,495,016,039	(11,348,635,287)	27,146,380,752
75	-	415,181,848,377	415,181,848,377	-	39,649,866,520	(11,689,094,346)	27,960,772,174
76	-	427,637,303,829	427,637,303,829	-	40,839,362,516	(12,039,767,176)	28,799,595,340
77	-	440,466,422,943	440,466,422,943	-	42,064,543,391	(12,400,960,191)	29,663,583,200
78	-	453,680,415,632	453,680,415,632	-	43,326,479,693	(12,772,988,997)	30,553,490,696
79	-	467,290,828,101	467,290,828,101	-	44,626,274,084	(13,156,178,667)	31,470,095,417
80	-	481,309,552,944	481,309,552,944	-	45,965,062,306	(13,550,864,027)	32,414,198,279
81	-	495,748,839,532	495,748,839,532	-	47,344,014,175	(13,957,389,948)	33,386,624,227
82	-	510,621,304,718	510,621,304,718	-	48,764,334,601	(14,376,111,646)	34,388,222,955
83	-	525,939,943,860	525,939,943,860	-	50,227,264,639	(14,807,394,996)	35,419,869,643
84	-	541,718,142,175	541,718,142,175	-	51,734,082,578	(15,251,616,846)	36,482,465,732
85	-	557,969,686,441	557,969,686,441	-	53,286,105,055	(15,709,165,351)	37,576,939,704
86	-	574,708,777,034	574,708,777,034	-	54,884,688,207	(16,180,440,312)	38,704,247,895
87	-	591,950,040,345	591,950,040,345	-	56,531,228,853	(16,665,853,521)	39,865,375,332
88	-	609,708,541,555	609,708,541,555	-	58,227,165,719	(17,165,829,126)	41,061,336,593
89	-	627,999,797,802	627,999,797,802	-	59,973,980,690	(17,680,804,000)	42,293,176,690
90	-	646,839,791,736	646,839,791,736	-	61,773,200,111	(18,211,228,120)	43,561,971,991
91	-	666,244,985,488	666,244,985,488	-	63,626,396,114	(18,757,564,964)	44,868,831,150
92	-	686,232,335,053	686,232,335,053	-	65,535,187,998	(19,320,291,913)	46,214,896,085
93	-	706,819,305,104	706,819,305,104	-	67,501,243,637	(19,899,900,670)	47,601,342,967
94	-	728,023,884,257	728,023,884,257	-	69,526,280,947	(20,496,897,690)	49,029,383,257
95	-	749,864,600,785	749,864,600,785	-	71,612,069,375	(21,111,804,621)	50,500,264,754
96	-	772,360,538,809	772,360,538,809	-	73,760,431,456	(21,745,158,760)	52,015,272,696
97	-	795,531,354,973	795,531,354,973	-	75,973,244,400	(22,397,513,522)	53,575,730,878
98	-	819,397,295,622	819,397,295,622	-	78,252,441,732	(23,069,438,928)	55,183,002,804
99	-	843,979,214,491	843,979,214,491	-	80,600,014,984	(23,761,522,096)	56,838,492,888

Single Discount Rate Development

PROJECTION OF PLAN FIDUCIARY NET POSITION BEGINNING SEPTEMBER 1, 2019

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.25%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
1	157,978,199,075	6,844,747,511	11,402,175,205	44,734,448	11,289,509,936	164,665,546,869
2	164,665,546,869	6,770,683,919	11,921,683,059	43,158,662	11,753,258,276	171,224,647,344
3	171,224,647,344	6,992,831,414	12,452,191,594	41,719,086	12,217,861,820	177,941,429,897
4	177,941,429,897	7,086,996,101	13,009,781,274	40,347,305	12,688,372,179	184,666,669,599
5	184,666,669,599	7,332,778,784	13,596,317,459	39,037,626	13,163,862,508	191,527,955,805
6	191,527,955,805	7,328,873,412	14,205,722,998	37,762,783	13,639,507,629	198,252,851,065
7	198,252,851,065	7,304,421,986	14,838,487,493	36,497,030	14,103,700,372	204,785,988,900
8	204,785,988,900	7,283,290,662	15,494,559,149	35,217,482	14,553,279,340	211,092,782,270
9	211,092,782,270	7,264,307,573	16,172,658,634	33,912,212	14,985,741,222	217,136,260,219
10	217,136,260,219	7,246,768,247	16,869,746,229	32,572,427	15,398,489,111	222,879,198,922
11	222,879,198,922	7,229,489,070	17,587,890,392	31,187,180	15,788,708,843	228,278,319,262
12	228,278,319,262	7,214,616,400	18,301,945,877	29,777,560	16,154,233,943	233,315,446,168
13	233,315,446,168	7,202,312,773	19,013,098,033	28,342,685	16,493,710,321	237,970,028,544
14	237,970,028,544	7,192,731,505	19,721,137,261	26,884,552	16,805,660,877	242,220,399,114
15	242,220,399,114	7,186,411,866	20,425,377,422	25,406,888	17,088,558,245	246,044,584,916
16	246,044,584,916	7,185,145,222	21,117,835,446	23,928,042	17,341,156,856	249,429,123,505
17	249,429,123,505	7,190,729,617	21,790,284,883	22,465,414	17,562,837,092	252,369,939,916
18	252,369,939,916	7,206,968,560	22,414,534,305	21,056,395	17,754,441,710	254,895,759,487
19	254,895,759,487	7,235,971,655	22,971,473,119	19,721,480	17,918,808,342	257,059,344,884
20	257,059,344,884	7,276,027,837	23,474,066,343	18,443,705	18,059,240,184	258,902,102,857
21	258,902,102,857	7,327,277,089	23,918,197,204	17,224,692	18,178,890,777	260,472,848,826
22	260,472,848,826	7,388,591,161	24,311,463,819	16,052,684	18,280,988,860	261,814,912,345
23	261,814,912,345	7,458,877,176	24,662,797,558	14,917,873	18,368,319,154	262,964,393,244
24	262,964,393,244	7,536,977,263	24,981,714,143	13,809,439	18,443,119,134	263,948,966,060
25	263,948,966,060	7,622,365,203	25,277,058,540	12,723,232	18,507,061,591	264,788,611,082
26	264,788,611,082	7,713,367,864	25,565,271,652	11,645,231	18,560,950,449	265,486,012,512
27	265,486,012,512	7,811,430,376	25,831,661,622	10,588,875	18,605,554,566	266,060,746,957
28	266,060,746,957	7,918,270,100	26,056,275,073	9,568,623	18,643,064,549	266,556,237,910
29	266,556,237,910	8,034,695,745	26,232,170,540	8,590,245	18,676,904,426	267,027,077,296
30	267,027,077,296	8,160,198,537	26,176,126,052	7,649,622	18,717,539,727	267,721,039,886
31	267,721,039,886	8,292,260,545	26,309,805,389	6,725,357	18,767,827,331	268,464,597,015
32	268,464,597,015	8,430,215,651	26,417,382,131	5,825,542	18,822,849,219	269,294,454,213
33	269,294,454,213	8,578,881,448	26,478,860,331	4,964,064	18,886,149,800	270,275,661,067
34	270,275,661,067	8,739,069,472	26,482,380,145	4,146,946	18,962,896,256	271,491,099,704
35	271,491,099,704	8,912,617,457	26,404,248,343	3,390,353	19,060,006,271	273,056,084,737
36	273,056,084,737	9,101,429,690	26,223,788,379	2,711,045	19,186,643,789	275,117,658,791
37	275,117,658,791	9,306,392,492	25,936,469,812	2,115,600	19,353,662,090	277,839,127,961
38	277,839,127,961	9,529,068,772	25,526,825,289	1,617,254	19,573,506,939	281,413,261,128
39	281,413,261,128	9,770,322,449	24,990,256,408	1,222,226	19,860,348,404	286,052,453,346
40	286,052,453,346	10,028,752,539	24,353,081,199	914,147	20,228,598,474	291,955,809,014
41	291,955,809,014	10,302,601,022	23,643,949,273	673,027	20,691,609,941	299,305,397,676
42	299,305,397,676	10,591,218,461	22,871,964,948	489,822	21,262,235,781	308,286,397,148
43	308,286,397,148	10,893,483,947	22,050,685,359	350,720	21,953,379,107	319,082,224,123
44	319,082,224,123	11,208,611,096	21,190,883,221	245,159	22,777,926,321	331,877,633,160
45	331,877,633,160	11,536,132,770	20,300,822,272	165,663	23,748,961,436	346,861,739,431
46	346,861,739,431	11,875,773,800	19,387,028,477	106,585	24,879,953,277	364,230,331,446
47	364,230,331,446	12,227,473,575	18,454,390,948	64,318	26,184,920,351	384,188,270,106
48	384,188,270,106	12,591,214,966	17,507,807,257	35,602	27,678,540,149	406,950,182,362
49	406,950,182,362	12,966,979,069	16,552,614,763	17,063	29,376,182,477	432,740,712,083
50	432,740,712,083	13,354,897,439	15,593,142,213	6,729	31,293,984,600	461,796,445,180

Single Discount Rate Development

Projection of Plan Fiduciary Net Position Beginning September 1, 2019 (continued)

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 8.50%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
51	461,796,445,180	13,755,093,518	14,634,303,929	2,449	33,448,928,442	494,366,160,762
52	494,366,160,762	14,167,597,756	13,682,318,678	1,046	35,858,830,201	530,710,268,995
53	530,710,268,995	14,592,554,561	12,742,546,151	370	38,542,383,942	571,102,660,977
54	571,102,660,977	15,030,302,408	11,818,461,901	95	41,519,335,054	615,833,836,442
55	615,833,836,442	15,481,203,011	10,913,289,046	14	44,810,642,864	665,212,393,258
56	665,212,393,258	15,945,637,805	10,029,939,708	1	48,438,590,588	719,566,681,941
57	719,566,681,941	16,424,006,800	9,171,113,920	-	52,426,901,725	779,246,476,545
58	779,246,476,545	16,916,727,004	8,339,508,052	-	56,800,853,711	844,624,549,208
59	844,624,549,208	17,424,228,814	7,537,850,693	-	61,587,390,677	916,098,318,006
60	916,098,318,006	17,946,955,679	6,768,845,206	-	66,815,244,943	994,091,673,422
61	994,091,673,422	18,485,364,349	6,035,181,967	-	72,515,069,017	1,079,056,924,821
62	1,079,056,924,821	19,039,925,279	5,339,507,304	-	78,719,577,832	1,171,476,920,628
63	1,171,476,920,628	19,611,123,037	4,684,358,022	-	85,463,704,809	1,271,867,390,452
64	1,271,867,390,452	20,199,456,728	4,072,103,198	-	92,784,773,742	1,380,779,517,724
65	1,380,779,517,724	20,805,440,431	3,504,767,443	-	100,722,691,632	1,498,802,882,345
66	1,498,802,882,345	21,429,603,643	2,983,859,781	-	109,320,168,135	1,626,568,794,342
67	1,626,568,794,342	22,072,491,753	2,510,288,919	-	118,622,960,289	1,764,753,957,465
68	1,764,753,957,465	22,734,666,505	2,084,361,571	-	128,680,138,197	1,914,084,400,596
69	1,914,084,400,596	23,416,706,501	1,705,814,767	-	139,544,368,928	2,075,339,661,258
70	2,075,339,661,258	24,119,207,696	1,373,760,466	-	151,272,221,805	2,249,357,330,293
71	2,249,357,330,293	24,842,783,927	1,086,788,883	-	163,924,494,237	2,437,037,819,574
72	2,437,037,819,574	25,588,067,444	843,058,505	-	177,566,554,190	2,639,349,382,703
73	2,639,349,382,703	26,355,709,467	640,212,935	-	192,268,707,169	2,857,333,586,404
74	2,857,333,586,404	27,146,380,752	475,331,688	-	208,106,594,666	3,092,111,230,135
75	3,092,111,230,135	27,960,772,174	344,841,764	-	225,161,626,503	3,344,888,787,047
76	3,344,888,787,047	28,799,595,340	244,505,005	-	243,521,448,273	3,616,965,325,655
77	3,616,965,325,655	29,663,583,200	169,636,335	-	263,280,435,409	3,909,739,707,929
78	3,909,739,707,929	30,553,490,696	115,428,850	-	284,540,203,496	4,224,717,973,270
79	4,224,717,973,270	31,470,095,417	77,240,900	-	307,410,133,399	4,563,520,961,186
80	4,563,520,961,186	32,414,198,279	50,913,315	-	332,007,912,639	4,927,892,158,789
81	4,927,892,158,789	33,386,624,227	33,065,919	-	358,460,093,802	5,319,705,810,899
82	5,319,705,810,899	34,388,222,955	21,153,064	-	386,902,680,564	5,740,975,561,354
83	5,740,975,561,354	35,419,869,643	13,323,612	-	417,481,759,204	6,193,863,866,588
84	6,193,863,866,588	36,482,465,732	8,258,070	-	450,354,186,912	6,680,692,261,163
85	6,680,692,261,163	37,576,939,704	5,033,815	-	485,688,340,874	7,203,952,507,926
86	7,203,952,507,926	38,704,247,895	3,016,133	-	523,664,930,563	7,766,318,670,251
87	7,766,318,670,251	39,865,375,332	1,775,715	-	564,477,875,944	8,370,660,145,812
88	8,370,660,145,812	41,061,336,593	1,027,181	-	608,335,254,650	9,020,055,709,875
89	9,020,055,709,875	42,293,176,690	583,618	-	655,460,321,762	9,717,808,624,709
90	9,717,808,624,709	43,561,971,991	325,502	-	706,092,606,388	10,467,462,877,587
91	10,467,462,877,587	44,868,831,150	178,097	-	760,489,089,753	11,272,820,620,392
92	11,272,820,620,392	46,214,896,085	95,542	-	818,925,470,170	12,137,960,891,105
93	12,137,960,891,105	47,601,342,967	50,186	-	881,697,520,770	13,067,259,704,657
94	13,067,259,704,657	49,029,383,257	25,693	-	949,122,546,364	14,065,411,608,585
95	14,065,411,608,585	50,500,264,754	12,686	-	1,021,540,946,422	15,137,452,807,075
96	15,137,452,807,075	52,015,272,696	6,057	-	1,099,317,891,707	16,288,785,965,421
97	16,288,785,965,421	53,575,730,878	2,909	-	1,182,845,122,701	17,525,206,816,090
98	17,525,206,816,090	55,183,002,804	1,450	-	1,272,542,878,636	18,852,932,696,080
99	18,852,932,696,080	56,838,492,888	775	-	1,368,861,966,495	20,278,633,154,688

Single Discount Rate Development

Present Values of Projected Benefits Beginning September 1, 2019

Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
1	\$ 157,978,199,075	\$ 11,402,175,205	\$ 11,402,175,205	\$ -	\$ 10,265,775,411	\$ -	\$ 10,265,775,411
2	164,665,546,869	11,921,683,059	11,921,683,059	-	10,007,931,397	-	10,007,931,397
3	171,224,647,344	12,452,191,594	12,452,191,594	-	9,746,647,090	-	9,746,647,090
4	177,941,429,897	13,009,781,274	13,009,781,274	-	9,494,719,548	-	9,494,719,548
5	184,666,669,599	13,596,317,459	13,596,317,459	-	9,252,011,025	-	9,252,011,025
6	191,527,955,805	14,205,722,998	14,205,722,998	-	9,013,238,983	-	9,013,238,983
7	198,252,851,065	14,838,487,493	14,838,487,493	-	8,778,289,079	-	8,778,289,079
8	204,785,988,900	15,494,559,149	15,494,559,149	-	8,546,772,952	-	8,546,772,952
9	211,092,782,270	16,172,658,634	16,172,658,634	-	8,317,772,956	-	8,317,772,956
10	217,136,260,219	16,869,746,229	16,869,746,229	-	8,089,783,341	-	8,089,783,341
11	222,879,198,922	17,587,890,392	17,587,890,392	-	7,864,023,282	-	7,864,023,282
12	228,278,319,262	18,301,945,877	18,301,945,877	-	7,630,113,636	-	7,630,113,636
13	233,315,446,168	19,013,098,033	19,013,098,033	-	7,390,763,850	-	7,390,763,850
14	237,970,028,544	19,721,137,261	19,721,137,261	-	7,147,778,625	-	7,147,778,625
15	242,220,399,114	20,425,377,422	20,425,377,422	-	6,902,587,600	-	6,902,587,600
16	246,044,584,916	21,117,835,446	21,117,835,446	-	6,654,170,695	-	6,654,170,695
17	249,429,123,505	21,790,284,883	21,790,284,883	-	6,401,918,532	-	6,401,918,532
18	252,369,939,916	22,414,534,305	22,414,534,305	-	6,140,159,522	-	6,140,159,522
19	254,895,759,487	22,971,473,119	22,971,473,119	-	5,867,343,033	-	5,867,343,033
20	257,059,344,884	23,474,066,343	23,474,066,343	-	5,590,409,999	-	5,590,409,999
21	258,902,102,857	23,918,197,204	23,918,197,204	-	5,311,124,401	-	5,311,124,401
22	260,472,848,826	24,311,463,819	24,311,463,819	-	5,033,520,477	-	5,033,520,477
23	261,814,912,345	24,662,797,558	24,662,797,558	-	4,761,083,168	-	4,761,083,168
24	262,964,393,244	24,981,714,143	24,981,714,143	-	4,496,642,528	-	4,496,642,528
25	263,948,966,060	25,277,058,540	25,277,058,540	-	4,242,241,248	-	4,242,241,248
26	264,788,611,082	25,565,271,652	25,565,271,652	-	4,000,570,601	-	4,000,570,601
27	265,486,012,512	25,831,661,622	25,831,661,622	-	3,769,003,750	-	3,769,003,750
28	266,060,746,957	26,056,275,073	26,056,275,073	-	3,544,779,749	-	3,544,779,749
29	266,556,237,910	26,232,170,540	26,232,170,540	-	3,327,467,726	-	3,327,467,726
30	267,027,077,296	26,176,126,052	26,176,126,052	-	3,095,905,511	-	3,095,905,511
31	267,721,039,886	26,309,805,389	26,309,805,389	-	2,901,366,944	-	2,901,366,944
32	268,464,597,015	26,417,382,131	26,417,382,131	-	2,716,298,542	-	2,716,298,542
33	269,294,454,213	26,478,860,331	26,478,860,331	-	2,538,573,313	-	2,538,573,313
34	270,275,661,067	26,482,380,145	26,482,380,145	-	2,367,282,763	-	2,367,282,763
35	271,491,099,704	26,404,248,343	26,404,248,343	-	2,200,744,516	-	2,200,744,516
36	273,056,084,737	26,223,788,379	26,223,788,379	-	2,037,951,998	-	2,037,951,998
37	275,117,658,791	25,936,469,812	25,936,469,812	-	1,879,369,101	-	1,879,369,101
38	277,839,127,961	25,526,825,289	25,526,825,289	-	1,724,649,008	-	1,724,649,008
39	281,413,261,128	24,990,256,408	24,990,256,408	-	1,574,263,145	-	1,574,263,145
40	286,052,453,346	24,353,081,199	24,353,081,199	-	1,430,418,875	-	1,430,418,875
41	291,955,809,014	23,643,949,273	23,643,949,273	-	1,294,887,485	-	1,294,887,485
42	299,305,397,676	22,871,964,948	22,871,964,948	-	1,167,933,701	-	1,167,933,701
43	308,286,397,148	22,050,685,359	22,050,685,359	-	1,049,879,619	-	1,049,879,619
44	319,082,224,123	21,190,883,221	21,190,883,221	-	940,739,046	-	940,739,046
45	331,877,633,160	20,300,822,272	20,300,822,272	-	840,304,018	-	840,304,018
46	346,861,739,431	19,387,028,477	19,387,028,477	-	748,232,828	-	748,232,828
47	364,230,331,446	18,454,390,948	18,454,390,948	-	664,091,507	-	664,091,507
48	384,188,270,106	17,507,807,257	17,507,807,257	-	587,438,850	-	587,438,850
49	406,950,182,362	16,552,614,763	16,552,614,763	-	517,845,510	-	517,845,510

Single Discount Rate Development

PVs of Projected Benefits Beginning September 1, 2019 (continued)

Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
50	\$ 432,740,712,083	\$ 15,593,142,213	\$ 15,593,142,213	\$ -	\$ 454,851,830	\$ -	\$ 454,851,830
51	461,796,445,180	14,634,303,929	14,634,303,929	-	398,025,665	-	398,025,665
52	494,366,160,762	13,682,318,678	13,682,318,678	-	346,977,574	-	346,977,574
53	530,710,268,995	12,742,546,151	12,742,546,151	-	301,301,032	-	301,301,032
54	571,102,660,977	11,818,461,901	11,818,461,901	-	260,560,190	-	260,560,190
55	615,833,836,442	10,913,289,046	10,913,289,046	-	224,339,352	-	224,339,352
56	665,212,393,258	10,029,939,708	10,029,939,708	-	192,243,128	-	192,243,128
57	719,566,681,941	9,171,113,920	9,171,113,920	-	163,899,372	-	163,899,372
58	779,246,476,545	8,339,508,052	8,339,508,052	-	138,962,728	-	138,962,728
59	844,624,549,208	7,537,850,693	7,537,850,693	-	117,113,815	-	117,113,815
60	916,098,318,006	6,768,845,206	6,768,845,206	-	98,056,837	-	98,056,837
61	994,091,673,422	6,035,181,967	6,035,181,967	-	81,518,535	-	81,518,535
62	1,079,056,924,821	5,339,507,304	5,339,507,304	-	67,246,530	-	67,246,530
63	1,171,476,920,628	4,684,358,022	4,684,358,022	-	55,007,445	-	55,007,445
64	1,271,867,390,452	4,072,103,198	4,072,103,198	-	44,585,421	-	44,585,421
65	1,380,779,517,724	3,504,767,443	3,504,767,443	-	35,779,643	-	35,779,643
66	1,498,802,882,345	2,983,859,781	2,983,859,781	-	28,402,587	-	28,402,587
67	1,626,568,794,342	2,510,288,919	2,510,288,919	-	22,279,524	-	22,279,524
68	1,764,753,957,465	2,084,361,571	2,084,361,571	-	17,248,763	-	17,248,763
69	1,914,084,400,596	1,705,814,767	1,705,814,767	-	13,161,926	-	13,161,926
70	2,075,339,661,258	1,373,760,466	1,373,760,466	-	9,883,285	-	9,883,285
71	2,249,357,330,293	1,086,788,883	1,086,788,883	-	7,290,179	-	7,290,179
72	2,437,037,819,574	843,058,505	843,058,505	-	5,272,947	-	5,272,947
73	2,639,349,382,703	640,212,935	640,212,935	-	3,733,557	-	3,733,557
74	2,857,333,586,404	475,331,688	475,331,688	-	2,584,627	-	2,584,627
75	3,092,111,230,135	344,841,764	344,841,764	-	1,748,331	-	1,748,331
76	3,344,888,787,047	244,505,005	244,505,005	-	1,155,831	-	1,155,831
77	3,616,965,325,655	169,636,335	169,636,335	-	747,701	-	747,701
78	3,909,739,707,929	115,428,850	115,428,850	-	474,380	-	474,380
79	4,224,717,973,270	77,240,900	77,240,900	-	295,980	-	295,980
80	4,563,520,961,186	50,913,315	50,913,315	-	181,907	-	181,907
81	4,927,892,158,789	33,065,919	33,065,919	-	110,154	-	110,154
82	5,319,705,810,899	21,153,064	21,153,064	-	65,705	-	65,705
83	5,740,975,561,354	13,323,612	13,323,612	-	38,588	-	38,588
84	6,193,863,866,588	8,258,070	8,258,070	-	22,300	-	22,300
85	6,680,692,261,163	5,033,815	5,033,815	-	12,674	-	12,674
86	7,203,952,507,926	3,016,133	3,016,133	-	7,081	-	7,081
87	7,766,318,670,251	1,775,715	1,775,715	-	3,887	-	3,887
88	8,370,660,145,812	1,027,181	1,027,181	-	2,096	-	2,096
89	9,020,055,709,875	583,618	583,618	-	1,111	-	1,111
90	9,717,808,624,709	325,502	325,502	-	578	-	578
91	10,467,462,877,587	178,097	178,097	-	295	-	295
92	11,272,820,620,392	95,542	95,542	-	147	-	147
93	12,137,960,891,105	50,186	50,186	-	72	-	72
94	13,067,259,704,657	25,693	25,693	-	34	-	34
95	14,065,411,608,585	12,686	12,686	-	16	-	16
96	15,137,452,807,075	6,057	6,057	-	7	-	7
97	16,288,785,965,421	2,909	2,909	-	3	-	3
98	17,525,206,816,090	1,450	1,450	-	1	-	1
99	18,852,932,696,080	775	775	-	1	-	1
Totals					\$ 232,962,015,855	\$ -	\$ 232,962,015,855