



November 5, 2020

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, 2020****

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, 2019. The total pension liability was rolled forward from the valuation date to the measurement date of August 31, 2020 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.

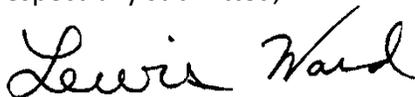
This report compliments the August 31, 2019 actuarial valuation report dated November 14, 2019 that was provided to TRS and should be considered together as a complete report for the plan year ending August 31, 2020. Please see the actuarial valuation report as of August 31, 2019 for additional discussion 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 assumptions 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. There is no change in assumptions this year.

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	434,426
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	310,716
Active Plan Members	<u>884,540</u>
Total Plan Members	1,629,682

All counts are as of the valuation date August 31, 2019

The Average Expected Remaining Service Life (AERSL) of 6.2975 is based on the membership information as of the beginning of the fiscal year. The AERSL of the active employees was 11.6025 years. This calculates to a total remaining service years of $11.6025 \times 884,540 = 10,262,875.35$ years. Divided by the total membership of 1,629,682 as of August 31, 2019 yields an AERSL of 6.2975 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.

Changes in Assumptions Since Prior Valuation

The actuarial assumptions and methods are the same as used in determining the prior year's Net Pension Liability.

Changes in Benefit Provisions Since Prior Valuation

The benefit provisions are the same as used in determining the prior year's Net Pension Liability.



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, 2019 (total pension liability rolled forward from valuation date to measurement date of August 31, 2020)
Actuarial Cost Method	Individual Entry Age Normal actuarial cost method
Asset Valuation Method	Market Value
Actuarial Assumptions:	
Single Discount Rate	7.25%
Long-term Expected Return	7.25%
Municipal Bond Rate*	2.33%
Last year ending August 31 in projection period (100 years)	2119
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 2.33% as of August 2020 (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, 2019. For a full description of these assumptions please see the actuarial valuation report dated November 14, 2019.



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 Rate Assumption	1% Increase
6.250%	7.250%	8.250%
\$82,585,415,626	\$53,557,959,841	\$29,973,787,965

Reconciliation of Fiduciary Net Position

for Year Ended August 31, 2020

	<u>Year Ending August 31, 2020</u>
Additions	
Contributions	
Non-Employer Contributing Entity	\$ 1,844,999,393
Employer	2,016,481,636
Employee	3,736,877,464
Other	340,383,559
Total Contributions	<u>\$ 7,938,742,052</u>
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 11,254,442,867
Interest and Dividends	0
Less Investment Expense	(222,312,131)
Net Investment Income	<u>\$ 11,032,130,736</u>
Other	<u>\$ 47,052,352</u>
Total Additions	<u>\$ 19,017,925,140</u>
Deductions	
Benefit payments, including refunds of employee contributions	\$ 11,393,658,347
Pension Plan Administrative Expense	67,135,880
Other	119,084,745
Total Deductions	<u>\$ 11,579,878,972</u>
Net Increase (Decrease) in Net Position	<u>\$ 7,438,046,168</u>
Net Position Restricted for Pensions	
Beginning of Year	<u>\$ 157,978,199,075</u>
End of Year	<u>\$ 165,416,245,243</u>



Schedules of Required Supplementary Information

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

Fiscal year ending August 31,	2020	2019	2018	2017	2016	2015	2014
Total Pension Liability							
Service Cost	\$ 5,651,646,985	\$ 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	15,014,048,172	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	-	-	-	-
Difference between Expected and Actual Experience	(259,157,014)	(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	(10,972,292,168)	(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	(421,366,179)	(486,460,902)	(422,335,740)	(420,421,056)	(373,418,687)	(391,341,181)	(410,600,319)
Net Change in Total Pension Liability	9,012,879,796	\$ 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	209,961,325,288	\$ 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)	\$ 218,974,205,084	\$ 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	1,844,999,393	\$ 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	\$ 2,016,481,636	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	3,736,877,464	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	11,032,130,736	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	(10,972,292,168)	(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	(421,366,179)	(486,460,902)	(422,335,740)	(420,421,056)	(373,418,687)	(391,341,181)	(410,600,319)
Pension Plan Administrative Expense	(67,135,880)	(60,485,645)	(64,926,169)	(44,189,998)	(44,402,710)	(35,556,979)	(41,904,190)
Other	268,351,166	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	7,438,046,168	\$ 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	157,978,199,075	\$ 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)	\$ 165,416,245,243	\$ 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)	53,557,959,841	\$ 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	75.54 %	75.24 %	73.74 %	82.17 %	78.00 %	78.43 %	83.25 %
Covered Employee Payroll	\$ 48,530,876,156	\$ 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	110.36 %	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%
2020	218,974,205,084	165,416,245,243	53,557,959,841	75.54%	48,530,876,156	110.36%



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%
2020	4,527,930,745	3,861,481,029	666,449,716	48,530,876,156	7.96%



Notes to Schedule of Contributions

Valuation Date: August 31, 2019 (to determine contribution rate for fiscal year ending August 31, 2020).

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	29 years based on increased employer and member rates enacted during 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 There were no benefit changes during the year.

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 2.330% (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, 2020

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	42,221,583,425	\$ 7,765,219,016	49,986,802,441	3,251,061,924	4,278,870,289	(317,726,822)	7,212,205,391
2	40,723,320,744	10,763,085,770	51,486,406,514	3,257,865,659	4,571,992,898	(402,768,831)	7,427,089,726
3	39,355,715,456	13,675,283,254	53,030,998,709	3,148,457,236	4,873,548,781	(505,408,347)	7,516,597,670
4	38,049,529,080	16,572,399,590	54,621,928,670	3,139,086,149	5,189,083,224	(563,734,754)	7,764,434,619
5	36,797,992,633	19,462,593,898	56,260,586,531	3,035,834,392	5,372,886,014	(653,945,524)	7,754,774,882
6	35,580,086,301	22,368,317,826	57,948,404,126	2,935,357,120	5,534,072,594	(742,762,833)	7,726,666,881
7	34,365,060,913	25,321,795,337	59,686,856,250	2,835,117,525	5,700,094,772	(831,322,448)	7,703,889,849
8	33,136,868,019	28,340,593,919	61,477,461,938	2,733,791,612	5,871,097,615	(920,233,555)	7,684,655,672
9	31,882,992,095	31,438,793,701	63,321,785,796	2,630,346,848	6,047,230,544	(1,009,844,365)	7,667,733,027
10	30,606,180,518	34,615,258,851	65,221,439,370	2,525,009,893	6,228,647,460	(1,100,272,358)	7,653,384,995
11	29,306,836,141	37,871,246,410	67,178,082,551	2,417,813,982	6,415,506,884	(1,191,719,107)	7,641,601,759
12	27,979,427,241	41,213,997,786	69,193,425,027	2,308,302,747	6,607,972,090	(1,284,261,457)	7,632,013,380
13	26,628,699,041	44,640,528,737	71,269,227,778	2,196,867,671	6,806,211,253	(1,377,967,637)	7,625,111,287
14	25,254,775,033	48,152,529,578	73,407,304,612	2,083,518,940	7,010,397,590	(1,472,844,867)	7,621,071,663
15	23,871,265,004	51,738,258,746	75,609,523,750	1,969,379,363	7,220,709,518	(1,568,744,691)	7,621,344,190
16	22,493,397,809	55,384,411,653	77,877,809,462	1,855,705,319	7,437,330,804	(1,665,367,419)	7,627,668,704
17	21,153,617,337	59,060,526,409	80,214,143,746	1,745,173,430	7,660,450,728	(1,761,941,794)	7,643,682,364
18	19,881,349,088	62,739,218,970	82,620,568,059	1,640,211,300	7,890,264,250	(1,857,761,855)	7,672,713,695
19	18,664,967,166	66,434,217,934	85,099,185,100	1,539,859,791	8,126,972,177	(1,953,354,072)	7,713,477,896
20	17,500,710,896	70,151,449,757	87,652,160,653	1,443,808,649	8,370,781,342	(2,049,061,966)	7,765,528,025
21	16,377,949,611	73,903,775,862	90,281,725,473	1,351,180,843	8,621,904,783	(2,145,340,049)	7,827,745,577
22	15,286,579,022	77,703,598,215	92,990,177,237	1,261,142,769	8,880,561,926	(2,242,800,511)	7,898,904,184
23	14,215,623,982	81,564,258,572	95,779,882,554	1,172,788,979	9,146,978,784	(2,342,049,002)	7,977,718,761
24	13,161,478,981	85,491,800,050	98,653,279,031	1,085,822,016	9,421,388,147	(2,443,530,480)	8,063,679,683
25	12,110,745,617	89,502,131,784	101,612,877,402	999,136,513	9,704,029,792	(2,548,131,999)	8,155,034,306
26	11,077,594,756	93,583,668,968	104,661,263,724	913,901,567	9,995,150,686	(2,655,606,020)	8,253,446,233
27	10,071,585,783	97,729,515,853	107,801,101,636	830,905,827	10,295,005,206	(2,765,668,572)	8,360,242,461
28	9,101,602,133	101,933,532,552	111,035,134,685	750,882,176	10,603,855,362	(2,878,096,197)	8,476,641,341
29	8,164,456,980	106,201,731,746	114,366,188,725	673,567,701	10,921,971,023	(2,993,346,383)	8,602,192,341
30	7,242,986,112	110,554,188,275	117,797,174,387	597,546,354	11,249,630,154	(3,112,559,815)	8,734,616,693
31	6,343,717,051	114,987,372,568	121,331,089,619	523,356,657	11,587,119,059	(3,237,372,375)	8,873,103,341
32	5,479,081,676	119,491,940,631	124,971,022,307	452,024,238	11,934,732,630	(3,364,194,685)	9,022,562,183
33	4,652,681,355	124,067,471,621	128,720,152,976	383,846,212	12,292,774,609	(3,493,014,896)	9,183,605,925
34	3,879,888,194	128,701,869,372	132,581,757,566	320,090,776	12,661,557,848	(3,623,492,451)	9,358,156,173
35	3,172,160,654	133,387,049,639	136,559,210,293	261,703,254	13,041,404,583	(3,755,399,745)	9,547,708,092
36	2,535,936,482	138,120,050,120	140,655,986,601	209,214,760	13,432,646,720	(3,888,653,377)	9,753,208,103
37	1,978,801,694	142,896,864,506	144,875,666,200	163,251,140	13,835,626,122	(4,023,140,553)	9,975,736,709
38	1,514,151,347	147,707,784,838	149,221,936,185	124,917,486	14,250,694,906	(4,158,587,952)	10,217,024,440
39	1,142,914,803	152,555,679,468	153,698,594,271	94,290,471	14,678,215,753	(4,295,076,332)	10,477,429,892
40	854,183,133	157,455,368,966	158,309,552,099	70,470,108	15,118,562,225	(4,433,022,952)	10,756,009,381
41	629,349,026	162,429,489,636	163,058,838,662	51,921,295	15,572,119,092	(4,573,065,119)	11,050,975,268
42	457,074,205	167,493,529,617	167,950,603,822	37,708,622	16,039,282,665	(4,715,638,888)	11,361,352,399
43	326,732,312	172,662,389,625	172,989,121,937	26,955,416	16,520,461,145	(4,861,163,777)	11,686,252,784
44	227,986,098	177,950,809,497	178,178,795,595	18,808,853	17,016,074,979	(5,010,054,773)	12,024,829,059
45	153,697,502	183,370,461,960	183,524,159,463	12,680,044	17,526,557,229	(5,162,640,512)	12,376,596,761
46	99,320,997	188,930,563,250	189,029,884,247	8,193,982	18,052,353,946	(5,319,180,468)	12,741,367,460
47	60,729,532	194,640,051,242	194,700,780,774	5,010,186	18,593,924,564	(5,479,926,281)	13,119,008,469
48	33,977,748	200,507,826,449	200,541,804,197	2,803,164	19,151,742,301	(5,645,128,537)	13,509,416,928
49	16,555,637	206,541,502,687	206,558,058,323	1,365,840	19,726,294,570	(5,815,001,597)	13,912,658,813



Single Discount Rate Development

Projection of Contributions Beginning September 1, 2020(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	Total Contributions
						of Future Employees	
50	6,705,335	212,748,094,738	212,754,800,073	553,190	20,318,083,407	(5,989,742,955)	14,328,893,642
51	2,501,105	219,134,942,969	219,137,444,075	206,341	20,927,625,909	(6,169,559,273)	14,758,272,977
52	1,068,700	225,710,498,697	225,711,567,397	88,168	21,555,454,686	(6,354,688,492)	15,200,854,362
53	395,957	232,482,518,462	232,482,914,419	32,666	22,202,118,327	(6,545,348,990)	15,656,802,003
54	93,469	239,457,308,383	239,457,401,852	7,711	22,868,181,877	(6,741,718,311)	16,126,471,277
55	12,762	246,641,111,146	246,641,123,907	1,053	23,554,227,333	(6,943,972,211)	16,610,256,175
56	1,240	254,040,356,384	254,040,357,624	102	24,260,854,153	(7,152,291,713)	17,108,562,542
57	-	261,661,568,353	261,661,568,353	-	24,988,679,778	(7,366,860,500)	17,621,819,278
58	-	269,511,415,404	269,511,415,404	-	25,738,340,171	(7,587,866,315)	18,150,473,856
59	-	277,596,757,866	277,596,757,866	-	26,510,490,376	(7,815,502,304)	18,694,988,072
60	-	285,924,660,602	285,924,660,602	-	27,305,805,087	(8,049,967,374)	19,255,837,713
61	-	294,502,400,420	294,502,400,420	-	28,124,979,240	(8,291,466,395)	19,833,512,845
62	-	303,337,472,432	303,337,472,432	-	28,968,728,617	(8,540,210,387)	20,428,518,230
63	-	312,437,596,605	312,437,596,605	-	29,837,790,476	(8,796,416,698)	21,041,373,778
64	-	321,810,724,504	321,810,724,504	-	30,732,924,190	(9,060,309,199)	21,672,614,991
65	-	331,465,046,239	331,465,046,239	-	31,654,911,916	(9,332,118,475)	22,322,793,441
66	-	341,408,997,626	341,408,997,626	-	32,604,559,273	(9,612,082,029)	22,992,477,244
67	-	351,651,267,555	351,651,267,555	-	33,582,696,051	(9,900,444,490)	23,682,251,561
68	-	362,200,805,581	362,200,805,581	-	34,590,176,933	(10,197,457,825)	24,392,719,108
69	-	373,066,829,749	373,066,829,749	-	35,627,882,241	(10,503,381,560)	25,124,500,681
70	-	384,258,834,641	384,258,834,641	-	36,696,718,708	(10,818,483,007)	25,878,235,701
71	-	395,786,599,680	395,786,599,680	-	37,797,620,269	(11,143,037,497)	26,654,582,772
72	-	407,660,197,671	407,660,197,671	-	38,931,548,878	(11,477,328,622)	27,454,220,256
73	-	419,890,003,601	419,890,003,601	-	40,099,495,344	(11,821,648,480)	28,277,846,864
74	-	432,486,703,709	432,486,703,709	-	41,302,480,204	(12,176,297,935)	29,126,182,269
75	-	445,461,304,820	445,461,304,820	-	42,541,554,610	(12,541,586,873)	29,999,967,737
76	-	458,825,143,965	458,825,143,965	-	43,817,801,249	(12,917,834,479)	30,899,966,770
77	-	472,589,898,284	472,589,898,284	-	45,132,335,286	(13,305,369,513)	31,826,965,773
78	-	486,767,595,232	486,767,595,232	-	46,486,305,345	(13,704,530,599)	32,781,774,746
79	-	501,370,623,089	501,370,623,089	-	47,880,894,505	(14,115,666,517)	33,765,227,988
80	-	516,411,741,782	516,411,741,782	-	49,317,321,340	(14,539,136,512)	34,778,184,828
81	-	531,904,094,035	531,904,094,035	-	50,796,840,980	(14,975,310,608)	35,821,530,372
82	-	547,861,216,857	547,861,216,857	-	52,320,746,210	(15,424,569,926)	36,896,176,284
83	-	564,297,053,362	564,297,053,362	-	53,890,368,596	(15,887,307,024)	38,003,061,572
84	-	581,225,964,963	581,225,964,963	-	55,507,079,654	(16,363,926,234)	39,143,153,420
85	-	598,662,743,912	598,662,743,912	-	57,172,292,044	(16,854,844,021)	40,317,448,023
86	-	616,622,626,229	616,622,626,229	-	58,887,460,805	(17,360,489,342)	41,526,971,463
87	-	635,121,305,016	635,121,305,016	-	60,654,084,629	(17,881,304,022)	42,772,780,607
88	-	654,174,944,167	654,174,944,167	-	62,473,707,168	(18,417,743,143)	44,055,964,025
89	-	673,800,192,492	673,800,192,492	-	64,347,918,383	(18,970,275,437)	45,377,642,946
90	-	694,014,198,266	694,014,198,266	-	66,278,355,934	(19,539,383,700)	46,738,972,234
91	-	714,834,624,214	714,834,624,214	-	68,266,706,612	(20,125,565,211)	48,141,141,401
92	-	736,279,662,941	736,279,662,941	-	70,314,707,811	(20,729,332,168)	49,585,375,643
93	-	758,368,052,829	758,368,052,829	-	72,424,149,045	(21,351,212,133)	51,072,936,912
94	-	781,119,094,414	781,119,094,414	-	74,596,873,517	(21,991,748,497)	52,605,125,020
95	-	804,552,667,246	804,552,667,246	-	76,834,779,722	(22,651,500,952)	54,183,278,770
96	-	828,689,247,264	828,689,247,264	-	79,139,823,114	(23,331,045,980)	55,808,777,134
97	-	853,549,924,682	853,549,924,682	-	81,514,017,807	(24,030,977,359)	57,483,040,448
98	-	879,156,422,422	879,156,422,422	-	83,959,438,341	(24,751,906,680)	59,207,531,661
99	-	905,531,115,095	905,531,115,095	-	86,478,221,492	(25,494,463,881)	60,983,757,611



Single Discount Rate Development

PROJECTION OF PLAN FIDUCIARY NET POSITION BEGINNING SEPTEMBER 1, 2020

Year	Projected Beginning	Projected Total	Projected Benefit	Projected	Projected Investment	Projected Ending Plan
	Plan Net Position	Contributions	Payments	Administrative Expenses	Earnings at 7.25%	Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
1	165,416,245,243	7,212,205,391	11,875,292,225	46,443,742	11,824,944,275	172,531,658,942
2	172,531,658,942	7,427,089,726	12,420,730,614	44,795,653	12,329,097,532	179,822,319,934
3	179,822,319,934	7,516,597,670	12,978,657,218	43,291,287	12,841,040,947	187,158,010,048
4	187,158,010,048	7,764,434,619	13,564,481,096	41,854,482	13,360,891,993	194,677,001,082
5	194,677,001,082	7,754,774,882	14,183,039,675	40,477,792	13,883,693,402	202,091,951,900
6	202,091,951,900	7,726,666,881	14,822,510,003	39,138,095	14,397,548,742	209,354,519,424
7	209,354,519,424	7,703,889,849	15,487,467,610	37,801,567	14,899,638,298	216,432,778,395
8	216,432,778,395	7,684,655,672	16,175,733,127	36,450,555	15,387,662,052	223,292,912,437
9	223,292,912,437	7,667,733,027	16,884,420,596	35,071,291	15,859,227,739	229,900,381,315
10	229,900,381,315	7,653,384,995	17,610,953,638	33,666,799	16,311,932,213	236,221,078,087
11	236,221,078,087	7,641,601,759	18,341,397,998	32,237,520	16,743,798,635	242,232,842,962
12	242,232,842,962	7,632,013,380	19,071,471,187	30,777,370	17,153,359,985	247,915,967,770
13	247,915,967,770	7,625,111,287	19,798,856,675	29,291,569	17,539,287,242	253,252,218,055
14	253,252,218,055	7,621,071,663	20,524,423,119	27,780,253	17,900,233,740	258,221,320,086
15	258,221,320,086	7,621,344,190	21,239,528,341	26,258,392	18,235,088,531	262,811,966,074
16	262,811,966,074	7,627,668,704	21,938,253,118	24,742,738	18,543,303,985	267,019,942,908
17	267,019,942,908	7,643,682,364	22,595,193,515	23,268,979	18,825,607,703	270,870,770,481
18	270,870,770,481	7,672,713,695	23,189,429,768	21,869,484	19,084,712,344	274,416,897,268
19	274,416,897,268	7,713,477,896	23,728,308,225	20,531,464	19,324,113,473	277,705,648,949
20	277,705,648,949	7,765,528,025	24,210,513,538	19,250,782	19,547,273,279	280,788,685,933
21	280,788,685,933	7,827,745,577	24,646,904,539	18,015,745	19,757,510,976	283,709,022,203
22	283,709,022,203	7,898,904,184	25,045,569,444	16,815,237	19,957,613,727	286,503,155,433
23	286,503,155,433	7,977,718,761	25,415,735,430	15,637,186	20,149,853,642	289,199,355,220
24	289,199,355,220	8,063,679,683	25,764,469,441	14,477,627	20,336,010,562	291,820,098,397
25	291,820,098,397	8,155,034,306	26,110,667,017	13,321,820	20,516,979,182	294,368,123,049
26	294,368,123,049	8,253,446,233	26,436,105,926	12,185,354	20,693,665,707	296,866,943,709
27	296,866,943,709	8,360,242,461	26,725,121,728	11,078,744	20,868,379,730	299,359,365,427
28	299,359,365,427	8,476,641,341	26,967,848,394	10,011,762	21,044,619,046	301,902,765,657
29	301,902,765,657	8,602,192,341	27,178,029,563	8,980,903	21,226,038,109	304,543,985,642
30	304,543,985,642	8,734,616,693	27,184,424,462	7,967,285	21,422,051,294	307,508,261,882
31	307,508,261,882	8,873,103,341	27,364,942,921	6,978,089	21,635,499,557	310,644,943,770
32	310,644,943,770	9,022,562,183	27,500,551,494	6,026,990	21,863,436,156	314,024,363,625
33	314,024,363,625	9,183,605,925	27,582,837,798	5,117,949	22,111,281,478	317,731,295,280
34	317,731,295,280	9,358,156,173	27,587,034,774	4,267,877	22,386,131,560	321,884,280,361
35	321,884,280,361	9,547,708,092	27,496,565,306	3,489,377	22,697,223,879	326,629,157,650
36	326,629,157,650	9,753,208,103	27,305,517,729	2,789,530	23,055,375,751	332,129,434,245
37	332,129,434,245	9,975,736,709	27,003,747,419	2,176,682	23,472,840,935	338,572,087,788
38	338,572,087,788	10,217,024,440	26,574,094,895	1,665,566	23,963,847,567	346,177,199,334
39	346,177,199,334	10,477,429,892	26,016,288,675	1,257,206	24,544,373,928	355,181,457,272
40	355,181,457,272	10,756,009,381	25,352,100,740	939,601	25,230,771,318	365,815,197,630
41	365,815,197,630	11,050,975,268	24,610,963,908	692,284	26,038,627,886	378,293,144,593
42	378,293,144,593	11,361,352,399	23,805,857,952	502,782	26,983,014,567	392,831,150,825
43	392,831,150,825	11,686,252,784	22,948,085,122	359,406	28,079,146,929	409,648,106,011
44	409,648,106,011	12,024,829,059	22,049,642,783	250,785	29,342,437,406	428,965,478,908
45	428,965,478,908	12,376,596,761	21,119,266,840	169,067	30,788,614,370	451,011,254,132
46	451,011,254,132	12,741,367,460	20,163,050,563	109,253	32,433,983,158	476,023,444,934
47	476,023,444,934	13,119,008,469	19,187,011,153	66,802	34,295,580,858	504,250,956,306
48	504,250,956,306	13,509,416,928	18,197,347,296	37,376	36,391,228,804	535,954,217,366
49	535,954,217,366	13,912,658,813	17,199,130,692	18,211	38,739,629,920	571,407,357,196
50	571,407,357,196	14,328,893,642	16,197,078,641	7,376	41,360,496,308	610,899,661,129



Single Discount Rate Development

Projection of Plan Fiduciary Net Position Beginning September 1, 2020 (continued)

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected		Projected Ending Plan Net Position
				Administrative Expenses	Projected Investment Earnings at 7.25%	
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
51	610,899,661,129	14,758,272,977	15,196,413,793	2,751	44,274,620,616	654,736,138,178
52	654,736,138,178	15,200,854,362	14,203,594,821	1,176	47,503,888,131	703,237,284,675
53	703,237,284,675	15,656,802,003	13,224,121,631	436	51,071,344,881	756,741,309,493
54	756,741,309,493	16,126,471,277	12,261,534,579	103	55,001,397,588	815,607,643,676
55	815,607,643,676	16,610,256,175	11,318,896,551	14	59,320,009,954	880,219,013,240
56	880,219,013,240	17,108,562,542	10,399,164,754	1	64,054,838,754	950,983,249,781
57	950,983,249,781	17,621,819,278	9,505,252,111	-	69,235,363,308	1,028,335,180,256
58	1,028,335,180,256	18,150,473,856	8,640,078,300	-	74,893,020,523	1,112,738,596,335
59	1,112,738,596,335	18,694,988,072	7,806,548,973	-	81,061,348,256	1,204,688,383,690
60	1,204,688,383,690	19,255,837,713	7,007,569,315	-	87,776,139,191	1,304,712,791,279
61	1,304,712,791,279	19,833,512,845	6,246,014,658	-	95,075,606,427	1,413,375,895,894
62	1,413,375,895,894	20,428,518,230	5,524,654,005	-	103,000,564,887	1,531,280,325,005
63	1,531,280,325,005	21,041,373,778	4,846,118,867	-	111,594,629,856	1,659,070,209,772
64	1,659,070,209,772	21,672,614,991	4,212,746,898	-	120,904,436,660	1,797,434,514,525
65	1,797,434,514,525	22,322,793,441	3,626,407,453	-	130,979,888,278	1,947,110,788,791
66	1,947,110,788,791	22,992,477,244	3,088,405,758	-	141,874,430,798	2,108,889,291,075
67	2,108,889,291,075	23,682,251,561	2,599,463,381	-	153,645,353,103	2,283,617,432,358
68	2,283,617,432,358	24,392,719,108	2,159,756,925	-	166,354,107,666	2,472,204,502,207
69	2,472,204,502,207	25,124,500,681	1,768,863,502	-	180,066,655,152	2,675,626,794,538
70	2,675,626,794,538	25,878,235,701	1,425,847,163	-	194,853,832,978	2,894,933,016,054
71	2,894,933,016,054	26,654,582,772	1,129,344,203	-	210,791,744,406	3,131,249,999,028
72	3,131,249,999,028	27,454,220,256	877,463,009	-	227,962,176,307	3,385,788,932,582
73	3,385,788,932,582	28,277,846,864	667,759,119	-	246,453,051,839	3,659,852,072,166
74	3,659,852,072,166	29,126,182,269	497,156,667	-	266,358,919,704	3,954,840,017,472
75	3,954,840,017,472	29,999,967,737	361,856,723	-	287,781,485,082	4,272,259,613,568
76	4,272,259,613,568	30,899,966,770	257,478,703	-	310,830,177,450	4,613,732,279,085
77	4,613,732,279,085	31,826,965,773	179,294,612	-	335,622,746,058	4,981,002,696,305
78	4,981,002,696,305	32,781,774,746	122,448,721	-	362,285,882,162	5,375,947,904,492
79	5,375,947,904,492	33,765,227,988	82,224,741	-	390,955,868,797	5,800,586,776,536
80	5,800,586,776,536	34,778,184,828	54,377,531	-	421,779,256,046	6,257,089,839,879
81	6,257,089,839,879	35,821,530,372	35,424,293	-	454,913,562,716	6,747,789,508,674
82	6,747,789,508,674	36,896,176,284	22,727,571	-	490,528,015,237	7,275,190,972,623
83	7,275,190,972,623	38,003,061,572	14,355,782	-	528,804,342,100	7,841,984,020,514
84	7,841,984,020,514	39,143,153,420	8,922,557	-	569,937,636,817	8,451,055,888,194
85	8,451,055,888,194	40,317,448,023	5,453,599	-	614,137,294,167	9,105,505,176,785
86	9,105,505,176,785	41,526,971,463	3,276,329	-	661,628,023,230	9,808,656,895,149
87	9,808,656,895,149	42,772,780,607	1,933,855	-	712,650,941,062	10,564,078,682,964
88	10,564,078,682,964	44,055,964,025	1,121,192	-	767,464,751,174	11,375,598,276,971
89	11,375,598,276,971	45,377,642,946	638,287	-	826,347,011,536	12,247,322,293,166
90	12,247,322,293,166	46,738,972,234	356,564	-	889,595,497,520	13,183,656,406,356
91	13,183,656,406,356	48,141,141,401	195,343	-	957,529,665,787	14,189,327,018,201
92	14,189,327,018,201	49,585,375,643	104,989	-	1,030,492,225,862	15,269,404,514,716
93	15,269,404,514,716	51,072,936,912	55,287	-	1,108,850,826,753	16,429,328,223,095
94	16,429,328,223,095	52,605,125,020	28,333	-	1,192,999,866,613	17,674,933,186,395
95	17,674,933,186,395	54,183,278,770	14,005	-	1,283,362,434,106	19,012,478,885,266
96	19,012,478,885,266	55,808,777,134	6,696	-	1,380,392,390,892	20,448,680,046,596
97	20,448,680,046,596	57,483,040,448	3,206	-	1,484,576,605,371	21,990,739,689,209
98	21,990,739,689,209	59,207,531,661	1,593	-	1,596,437,348,581	23,646,384,567,859
99	23,646,384,567,859	60,983,757,611	850	-	1,716,534,863,945	25,423,903,188,565



Single Discount Rate Development

Present Values of Projected Benefits Beginning September 1, 2020

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 ((a)-.5)	(g)=(e)*vf ^a ((a)-.5)	(h)=[(c)/(1+sdr) ^a ((a)-.5)]
1	\$ 165,416,245,243	\$ 11,875,292,225	\$ 11,875,292,225	\$ -	\$ 10,691,739,140	\$ -	\$ 10,691,739,140
2	172,531,658,942	12,420,730,614	12,420,730,614	-	10,426,868,360	-	10,426,868,360
3	179,822,319,934	12,978,657,218	12,978,657,218	-	10,158,725,125	-	10,158,725,125
4	187,158,010,048	13,564,481,096	13,564,481,096	-	9,899,547,203	-	9,899,547,203
5	194,677,001,082	14,183,039,675	14,183,039,675	-	9,651,263,280	-	9,651,263,280
6	202,091,951,900	14,822,510,003	14,822,510,003	-	9,404,577,649	-	9,404,577,649
7	209,354,519,424	15,487,467,610	15,487,467,610	-	9,162,218,713	-	9,162,218,713
8	216,432,778,395	16,175,733,127	16,175,733,127	-	8,922,507,381	-	8,922,507,381
9	223,292,912,437	16,884,420,596	16,884,420,596	-	8,683,839,818	-	8,683,839,818
10	229,900,381,315	17,610,953,638	17,610,953,638	-	8,445,224,808	-	8,445,224,808
11	236,221,078,087	18,341,397,998	18,341,397,998	-	8,200,936,989	-	8,200,936,989
12	242,232,842,962	19,071,471,187	19,071,471,187	-	7,950,930,100	-	7,950,930,100
13	247,915,967,770	19,798,856,675	19,798,856,675	-	7,696,203,634	-	7,696,203,634
14	253,252,218,055	20,524,423,119	20,524,423,119	-	7,438,923,573	-	7,438,923,573
15	258,221,320,086	21,239,528,341	21,239,528,341	-	7,177,723,179	-	7,177,723,179
16	262,811,966,074	21,938,253,118	21,938,253,118	-	6,912,682,001	-	6,912,682,001
17	267,019,942,908	22,595,193,515	22,595,193,515	-	6,638,398,207	-	6,638,398,207
18	270,870,770,481	23,189,429,768	23,189,429,768	-	6,352,431,689	-	6,352,431,689
19	274,416,897,268	23,728,308,225	23,728,308,225	-	6,060,652,847	-	6,060,652,847
20	277,705,648,949	24,210,513,538	24,210,513,538	-	5,765,796,815	-	5,765,796,815
21	280,788,685,933	24,646,904,539	24,646,904,539	-	5,472,936,567	-	5,472,936,567
22	283,709,022,203	25,045,569,444	25,045,569,444	-	5,185,511,970	-	5,185,511,970
23	286,503,155,433	25,415,735,430	25,415,735,430	-	4,906,435,690	-	4,906,435,690
24	289,199,355,220	25,764,469,441	25,764,469,441	-	4,637,536,413	-	4,637,536,413
25	291,820,098,397	26,110,667,017	26,110,667,017	-	4,382,145,512	-	4,382,145,512
26	294,368,123,049	26,436,105,926	26,436,105,926	-	4,136,842,730	-	4,136,842,730
27	296,866,943,709	26,725,121,728	26,725,121,728	-	3,899,365,263	-	3,899,365,263
28	299,359,365,427	26,967,848,394	26,967,848,394	-	3,668,793,125	-	3,668,793,125
29	301,902,765,657	27,178,029,563	27,178,029,563	-	3,447,446,946	-	3,447,446,946
30	304,543,985,642	27,184,424,462	27,184,424,462	-	3,215,159,085	-	3,215,159,085
31	307,508,261,882	27,364,942,921	27,364,942,921	-	3,017,724,367	-	3,017,724,367
32	310,644,943,770	27,500,551,494	27,500,551,494	-	2,827,672,612	-	2,827,672,612
33	314,024,363,625	27,582,837,798	27,582,837,798	-	2,644,413,507	-	2,644,413,507
34	317,731,295,280	27,587,034,774	27,587,034,774	-	2,466,028,791	-	2,466,028,791
35	321,884,280,361	27,496,565,306	27,496,565,306	-	2,291,787,084	-	2,291,787,084
36	326,629,157,650	27,305,517,729	27,305,517,729	-	2,122,017,368	-	2,122,017,368
37	332,129,434,245	27,003,747,419	27,003,747,419	-	1,956,704,551	-	1,956,704,551
38	338,572,087,788	26,574,094,895	26,574,094,895	-	1,795,404,869	-	1,795,404,869
39	346,177,199,334	26,016,288,675	26,016,288,675	-	1,638,898,127	-	1,638,898,127
40	355,181,457,272	25,352,100,740	25,352,100,740	-	1,489,097,955	-	1,489,097,955
41	365,815,197,630	24,610,963,908	24,610,963,908	-	1,347,847,129	-	1,347,847,129
42	378,293,144,593	23,805,857,952	23,805,857,952	-	1,215,622,001	-	1,215,622,001
43	392,831,150,825	22,948,085,122	22,948,085,122	-	1,092,606,714	-	1,092,606,714
44	409,648,106,011	22,049,642,783	22,049,642,783	-	978,862,452	-	978,862,452
45	428,965,478,908	21,119,266,840	21,119,266,840	-	874,181,575	-	874,181,575
46	451,011,254,132	20,163,050,563	20,163,050,563	-	778,183,018	-	778,183,018
47	476,023,444,934	19,187,011,153	19,187,011,153	-	690,455,252	-	690,455,252
48	504,250,956,306	18,197,347,296	18,197,347,296	-	610,574,963	-	610,574,963
49	535,954,217,366	17,199,130,692	17,199,130,692	-	538,071,642	-	538,071,642



Single Discount Rate Development

PVs of Projected Benefits Beginning September 1, 2020 (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	\$ 571,407,357,196	\$ 16,197,078,641	\$ 16,197,078,641	\$ -	\$ 472,468,651	\$ -	\$ 472,468,651
51	610,899,661,129	15,196,413,793	15,196,413,793	-	413,314,000	-	413,314,000
52	654,736,138,178	14,203,594,821	14,203,594,821	-	360,196,908	-	360,196,908
53	703,237,284,675	13,224,121,631	13,224,121,631	-	312,688,018	-	312,688,018
54	756,741,309,493	12,261,534,579	12,261,534,579	-	270,328,560	-	270,328,560
55	815,607,643,676	11,318,896,551	11,318,896,551	-	232,677,234	-	232,677,234
56	880,219,013,240	10,399,164,754	10,399,164,754	-	199,320,038	-	199,320,038
57	950,983,249,781	9,505,252,111	9,505,252,111	-	169,870,843	-	169,870,843
58	1,028,335,180,256	8,640,078,300	8,640,078,300	-	143,971,185	-	143,971,185
59	1,112,738,596,335	7,806,548,973	7,806,548,973	-	121,288,517	-	121,288,517
60	1,204,688,383,690	7,007,569,315	7,007,569,315	-	101,515,113	-	101,515,113
61	1,304,712,791,279	6,246,014,658	6,246,014,658	-	84,366,299	-	84,366,299
62	1,413,375,895,894	5,524,654,005	5,524,654,005	-	69,578,295	-	69,578,295
63	1,531,280,325,005	4,846,118,867	4,846,118,867	-	56,906,969	-	56,906,969
64	1,659,070,209,772	4,212,746,898	4,212,746,898	-	46,125,327	-	46,125,327
65	1,797,434,514,525	3,626,407,453	3,626,407,453	-	37,021,447	-	37,021,447
66	1,947,110,788,791	3,088,405,758	3,088,405,758	-	29,397,733	-	29,397,733
67	2,108,889,291,075	2,599,463,381	2,599,463,381	-	23,070,972	-	23,070,972
68	2,283,617,432,358	2,159,756,925	2,159,756,925	-	17,872,684	-	17,872,684
69	2,472,204,502,207	1,768,863,502	1,768,863,502	-	13,648,405	-	13,648,405
70	2,675,626,794,538	1,425,847,163	1,425,847,163	-	10,258,013	-	10,258,013
71	2,894,933,016,054	1,129,344,203	1,129,344,203	-	7,575,640	-	7,575,640
72	3,131,249,999,028	877,463,009	877,463,009	-	5,488,131	-	5,488,131
73	3,385,788,932,582	667,759,119	667,759,119	-	3,894,200	-	3,894,200
74	3,659,852,072,166	497,156,667	497,156,667	-	2,703,301	-	2,703,301
75	3,954,840,017,472	361,856,723	361,856,723	-	1,834,596	-	1,834,596
76	4,272,259,613,568	257,478,703	257,478,703	-	1,217,160	-	1,217,160
77	4,613,732,279,085	179,294,612	179,294,612	-	790,272	-	790,272
78	4,981,002,696,305	122,448,721	122,448,721	-	503,230	-	503,230
79	5,375,947,904,492	82,224,741	82,224,741	-	315,077	-	315,077
80	5,800,586,776,536	54,377,531	54,377,531	-	194,284	-	194,284
81	6,257,089,839,879	35,424,293	35,424,293	-	118,011	-	118,011
82	6,747,789,508,674	22,727,571	22,727,571	-	70,595	-	70,595
83	7,275,190,972,623	14,355,782	14,355,782	-	41,577	-	41,577
84	7,841,984,020,514	8,922,557	8,922,557	-	24,094	-	24,094
85	8,451,055,888,194	5,453,599	5,453,599	-	13,731	-	13,731
86	9,105,505,176,785	3,276,329	3,276,329	-	7,692	-	7,692
87	9,808,656,895,149	1,933,855	1,933,855	-	4,233	-	4,233
88	10,564,078,682,964	1,121,192	1,121,192	-	2,288	-	2,288
89	11,375,598,276,971	638,287	638,287	-	1,215	-	1,215
90	12,247,322,293,166	356,564	356,564	-	633	-	633
91	13,183,656,406,356	195,343	195,343	-	323	-	323
92	14,189,327,018,201	104,989	104,989	-	162	-	162
93	15,269,404,514,716	55,287	55,287	-	80	-	80
94	16,429,328,223,095	28,333	28,333	-	38	-	38
95	17,674,933,186,395	14,005	14,005	-	18	-	18
96	19,012,478,885,266	6,696	6,696	-	8	-	8
97	20,448,680,046,596	3,206	3,206	-	3	-	3
98	21,990,739,689,209	1,593	1,593	-	2	-	2
99	23,646,384,567,859	850	850	-	1	-	1
Totals					\$ 242,180,203,595	\$ -	\$ 242,180,203,595

