

# City of Manchester Employees' Contributory Retirement System

GASB Statement Nos. 67 and 68 Accounting and  
Financial Reporting for Pensions

December 31, 2018



May 10, 2019

Board of Trustees  
City of Manchester Employees'  
Contributory Retirement System  
1045 Elm Street, Suite 403  
Manchester, New Hampshire 03101-1824

Dear Board Members:

The purpose of this report is to provide the accounting and financial reporting information that is intended to comply with the Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68 for the City of Manchester Employees' Contributory Retirement System (MECRS). These calculations have been made on a basis that is consistent with our understanding of these accounting standards. This report should not be relied upon for any other purpose than described herein.

GASB Statement Nos. 67 and 68 are the accounting standards that apply to the stand-alone financial reports issued by retirement systems. This information is presented in draft form for review by the City's auditor. Please let us know if there are items that the auditor changes so that we may maintain consistency with the City's financial statements.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of assisting in the reporting and disclosure information that satisfies certain requirements of GASB Statement Nos. 67 and 68. The Net Pension Liability is not an appropriate measure for determining the sufficiency of plan assets to cover the estimated cost of settling the employer's benefit obligation. The Net Pension Liability is not an appropriate measure for assessing the need for or amount of future employer contributions. The calculation of the City's liability for this report may not be applicable for funding purposes of the Retirement System. A calculation of the City's liability for purposes other than satisfying the requirements of GASB Statement Nos. 67 and 68 may produce significantly different results. GASB Statement Nos. 67 and 68 cover pension benefits provided by the Retirement System. The Retirement System also provides post-retirement health benefits through a Section 401(h) sub-trust. The assets and liabilities of the sub-trust have not been included in this report. Please refer to the actuarial valuation for information concerning the liabilities and assets of the sub-trust.

This report may be provided to parties other than the City of Manchester Employees' Contributory Retirement System and the Board of Trustees only in its entirety and only with the permission of the Board. Authorized or unauthorized use of this report does not create a liability between GRS and the other party. GRS is not responsible for unauthorized use of this report.

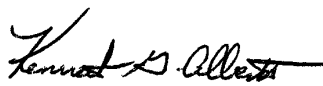
This report is based upon information, furnished to us by the Retirement System, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. If your understanding of this information is different, please let us know. This information was checked for internal consistency, but was not audited. We are not responsible for the accuracy or completeness of such information.

This report complements the actuarial valuation report provided to the City of Manchester Employees' Contributory Retirement System and should be considered collectively as a combined report for the plan year ending December 31, 2018. Please refer to the December 31, 2018 actuarial valuation report for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the City of Manchester Employees' Contributory Retirement System for the purposes of GASB Statements No. 67 and No. 68 reporting. 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. Heidi G. Barry 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 opinions contained herein. The signing individuals are independent of the plan sponsor.

This communication shall not be construed to provide tax advice, legal advice, accounting advice, or investment advice.

Respectfully submitted,



Kenneth G. Alberts



Heidi G. Barry, ASA, FCA, MAAA

KGA/HGB:dj



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# SECTION A



## EXECUTIVE SUMMARY

# Executive Summary as of December 31, 2018

Actuarial Valuation Date	December 31, 2018
Measurement Date of the Net Pension Liability	December 31, 2018
Employer's Fiscal Year Ending Date (Reporting Date)	June 30, 2019

## Membership

Number of	
- Retirees and Beneficiaries	914
- Inactive, Nonretired Members	109
- Active Members	1,142
- Total	2,165
Covered Payroll #	\$ 51,787,265

## Net Pension Liability

Total Pension Liability	\$ 355,948,216
Plan Fiduciary Net Position	203,944,655
Net Pension Liability	\$ 152,003,561
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	57.30%
Net Pension Liability as a Percentage of Covered Payroll	293.52%

## Development of the Single Discount Rate

Single Discount Rate	7.00%
Long-Term Expected Rate of Investment Return	7.00%
Long-Term Municipal Bond Rate*	3.71%
Last year ending December 31 in the 2019 to 2118 projection period for which projected benefit payments are fully funded	2118

**Total Pension Expense** \$ 22,840,208

## Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience	\$ 1,908,615	\$ 2,583,898
Changes in assumptions	6,271,507	-
Net difference between projected and actual earnings on pension plan investments	25,983,686	9,975,901
Total	\$ 34,163,808	\$ 12,559,799

# Based on valuation payroll as of December 31, 2018.

\* Source: Fixed-Income 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" as of December 28, 2018, the most recent date available on or before the measurement date. In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax exempt securities.

# Discussion

## Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68 establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the Net Pension Liability, pension expense, and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

## Financial Statements

GASB Statement No. 68 requires State or local governments to recognize the Net Pension Liability and the pension expense on their financial statements. The Net Pension Liability is the difference between the Total Pension Liability and the Plan's Fiduciary Net Position. In traditional actuarial terms, this is analogous to 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).

Paragraph 57 of GASB Statement No. 68 States, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to MECRS subsequent to the measurement date of December 31, 2018.

The pension expense recognized each fiscal year is equal to the change in the Net Pension Liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the liability and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position in accordance with GASB Statement No. 67. The statement of fiduciary net position presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The statement of changes in fiduciary net position presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

## Notes to Financial Statements

GASB Statement No. 68 requires the notes of the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows and inflows of resources related to pensions.

GASB Statement Nos. 67 and 68 require the notes of the financial statements for the employers and pension plans to include certain additional information. The list of disclosure items should include:

- a description of benefits provided by the plan;
- the type of employees and number of members covered by the pension plan;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- the pension Plan's Fiduciary Net Position, Net Pension Liability, and the pension plan's fiduciary net position as a percentage of the Total Pension Liability;
- the Net Pension Liability using a discount rate that is 1% higher and 1% lower than used to calculate the Total Pension Liability and Net Pension Liability for financial reporting purposes;
- significant assumptions and methods used to calculate the Total Pension Liability;
- inputs to the discount rates; and
- certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with GASB Statement No. 67. This information includes:

- the composition of the pension plan's Board and the authority under which benefit terms may be amended;
- a description of how fair value is determined;
- information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets; and
- annual money-weighted rate of return.

## Required Supplementary Information

GASB Statement No. 67 requires a 10-year fiscal history of:

- sources of changes in the Net Pension Liability;
- information about the components of the Net Pension Liability and related ratios, including the pension plan's Fiduciary Net Position as a percentage of the Total Pension Liability, and the Net Pension Liability as a percent of covered-employee payroll; and
- comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.



## General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.00% on the actuarial value of assets), then the following outcomes are expected:

1. The employer normal cost as a percentage of pay is expected to remain level as a percentage of payroll.
2. The unfunded liability is expected to be paid off in approximately 21 years, which is the number of years remaining in the closed amortization schedule of the unfunded liability.
3. The funded status of the plan is expected to reach a 100% funded ratio in approximately 21 years, which is the number of years remaining in the closed amortization schedule of the unfunded liability.

This funding policy results in the expectation that the plan's assets will be able to fully pay for promised benefits through at least 2118. The projections in this report are strictly for the purpose of determining the GASB single discount rate and are different from a funding projection for the ongoing plan.

### Timing of the Valuation

An actuarial valuation to determine the Total Pension Liability is required to be performed at least every two years. The Net Pension Liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the Total Pension Liability is not calculated as of the measurement date, the Total Pension Liability is required to be rolled-forward from the actuarial valuation date to the measurement date.

The Total Pension Liability shown in this report is based on an actuarial valuation performed as of December 31, 2018 and a measurement date of December 31, 2018.

### Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a Single Discount Rate that reflects: (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's 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 7.00%; the municipal bond rate is 3.71% (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 7.00%.

**SECTION B**



**FINANCIAL STATEMENTS**

# Statement of Pension Expense Under GASB Statement No. 68

## Plan Year Ended December 31, 2018

### A. Expense

1. Service Cost	\$	6,361,053
2. Interest on the Total Pension Liability		23,689,732
3. Current-Period Benefit Changes		0
4. Employee Contributions (made negative for addition here)		(2,387,580)
5. Projected Earnings on Plan Investments (made negative for addition here)		(15,223,134)
6. Pension Plan Administrative Expense		702,533
7. Other Changes in Plan Fiduciary Net Position		59,532
8. Recognition of Outflow (Inflow) of Resources due to Liabilities		2,131,387
9. Recognition of Outflow (Inflow) of Resources due to Assets		7,506,685
<b>10. Total Pension Expense</b>	<b>\$</b>	<b>22,840,208</b>

# Statement of Outflows and Inflows Arising from Current Reporting Period Plan Year Ended December 31, 2018

## A. Outflows (Inflows) of Resources Due to Liabilities

1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	\$	(172,714)
2. Assumption Changes (gains) or losses	\$	-
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}		5.3888
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability	\$	(32,051)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	\$	-
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	\$	(32,051)
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	\$	(140,663)
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	\$	-
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	\$	(140,663)

## B. Outflows (Inflows) of Resources Due to Assets

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	\$	26,947,183
2. Recognition period for Assets {in years}		5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	\$	5,389,437
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	\$	21,557,746

# Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods Plan Year Ended December 31, 2018

## A. Outflows and Inflows of Resources Due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Due to Liabilities	\$ 3,082,985	\$ 951,598	\$ 2,131,387
2. Due to Assets	10,831,985	3,325,300	7,506,685
<b>3. Total</b>	<b>\$ 13,914,970</b>	<b>\$ 4,276,898</b>	<b>\$ 9,638,072</b>

## B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	\$ 1,285,579	\$ 951,598	\$ 333,981
2. Assumption Changes	1,797,406	-	1,797,406
3. Net Difference between projected and actual earnings on pension plan investments	10,831,985	3,325,300	7,506,685
<b>4. Total</b>	<b>\$ 13,914,970</b>	<b>\$ 4,276,898</b>	<b>\$ 9,638,072</b>

## C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows of Resources
1. Differences between expected and actual experience	\$ 1,908,615	\$ 2,583,898	\$ (675,283)
2. Assumption Changes	6,271,507	-	6,271,507
3. Net Difference between projected and actual earnings on pension plan investments	25,983,686	9,975,901	16,007,785
<b>4. Total</b>	<b>\$ 34,163,808</b>	<b>\$ 12,559,799</b>	<b>\$ 21,604,009</b>

## D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending December 31	Net Deferred Outflows of Resources
2019	\$ 8,176,869
2020	3,922,971
2021	3,262,019
2022	6,254,609
2023	(12,459)
Thereafter	0
<b>Total</b>	<b>\$ 21,604,009</b>

## Recognition of Deferred Outflows and Inflows of Resources

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
<b>Deferred Outflow (Inflow) Due to Differences Between Expected and Actual Experience on Liabilities</b>					
2014	\$ 2,716,119	5.8007	\$ 468,240	\$ 374,919	0.8007
2015	4,528,433	5.8007	780,670	1,405,753	1.8007
2016	(5,201,876)	5.6570	(919,547)	(2,443,235)	2.6570
2017	201,281	5.4892	36,669	127,943	3.4892
2018	(172,714)	5.3888	(32,051)	(140,663)	4.3888
<b>Total</b>			<b>333,981</b>	<b>(675,283)</b>	
<b>Deferred Outflow (Inflow) Due to Assumption Changes</b>					
2014	\$ 0	5.8007	\$ 0	\$ 0	0.8007
2015	0	5.8007	0	0	1.8007
2016	0	5.6570	0	0	2.6570
2017	9,866,319	5.4892	1,797,406	6,271,507	3.4892
2018	0	5.3888	0	0	4.3888
<b>Total</b>			<b>1,797,406</b>	<b>6,271,507</b>	
<b>Deferred Outflow (Inflow) Due to Differences Between Projected and Actual Earnings on Plan Investments</b>					
2014	\$ 6,839,392	5.0000	\$ 1,367,880	\$ 0	0.0
2015	18,616,968	5.0	3,723,394	3,723,392	1.0
2016	1,756,370	5.0	351,274	702,548	2.0
2017	(16,626,501)	5.0	(3,325,300)	(9,975,901)	3.0
2018	26,947,183	5.0	5,389,437	21,557,746	4.0
<b>Total</b>			<b>7,506,685</b>	<b>16,007,785</b>	

According to paragraph 33 of GASB No. 68, differences between expected and actual experience and changes in assumptions are recognized in pension expense using a systematic and rational method over a closed period equal to the average of the expected remaining service lives of all employees that are provided with pensions through the pension plan (active employees and inactive employees) determined as of the beginning of the measurement period.

At the beginning of the current measurement period, the expected remaining service lives of all active employees in the plan was approximately 11,667 years. Additionally, the total plan membership (active employees and inactive employees) was 2,165. As a result, the average of the expected remaining service lives for purposes of recognizing the applicable deferred outflows and inflows of resources established in the current measurement period is 5.3888 years.

Additionally, differences between projected and actual earnings on pension plan investments should be recognized in pension expense using a systematic and rational method over a closed five-year period. For this purpose, the deferred outflows and inflows of resources are recognized in the pension expense as a level dollar amount over the closed period identified above.

## Statement of Fiduciary Net Position as of December 31, 2018

### Assets

Cash and Deposits	\$	4,745,085
Receivables		
Accounts Receivable	\$	412,399
Accrued Interest and Other Dividends		35,816
Additional Contribution Account		949,254
Property, Plant, Equipment		1,669
Total Receivables	<u>\$</u>	<u>1,399,138</u>
Investments	\$	211,751,042
<b>Total Assets</b>	<u>\$</u>	<u>217,895,265</u>

### Liabilities

Payables		
Accounts Payable and Accrued Expenses	\$	137,034
Payable for Investments Purchased		5,093
Benefits Payable		1,540,025
Total Liabilities	<u>\$</u>	<u>1,682,152</u>
<b>Assets held for 401(h) Subtrust</b>	<u>\$</u>	<u>12,268,458</u>
<b>Net Position Restricted for Pensions</b>	<u>\$</u>	<u>203,944,655</u>

## Statement of Changes in Fiduciary Net Position for Year Ended December 31, 2018

### Additions

Contributions	
Employer	\$ 13,113,367
Employee (Including Additional Contributions, Buybacks, Upgrades and Enrollments)	2,387,580
Total Contributions	\$ 15,500,947
Other	\$ -
Investment Income	
Net Appreciation in Fair Value of Investments	\$ (13,806,918)
Less Investment Expense	(760,518)
Net Investment Income	\$ (11,682,616)
<b>Total Additions</b>	<b>\$ 3,818,331</b>

### Deductions

Benefit Payments, Additional Contribution Payments, and Refunds of Employee Contributions	\$ 18,348,151
Pension Plan Administrative Expense	702,533
Other: Custodial Fees and Foreign Taxes	59,532
<b>Total Deductions</b>	<b>\$ 19,110,216</b>
<b>Net Increase in Net Position</b>	<b>\$ (15,291,885)</b>

### Net Position Restricted for Pensions

Beginning of Year	\$ 219,277,973
Prior Year Adjustment	(41,433)
End of Year	\$ 203,944,655



## Schedule of Proportionate Employer Share for Year Ended December 31, 2018

### Deferred Outflows of Resources

Covered Payroll	Employer	Prop. Share	Net Pension Liability	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments*	Changes of Assum.	Changes in Proportion and Differences Between Employer Cont. and Share of Cont.	Total Deferred Outflows of Resources
\$ 4,581,356	Airport	8.85%	\$ 13,452,315	\$ 168,912	\$ 2,299,556	\$ 555,028	\$ 350,101	\$ 3,373,597
591,958	Parking Control	1.14%	1,732,841	21,758	296,214	71,495	316,028	705,495
2,157,466	Environmental Protection	4.17%	6,338,548	79,589	1,083,520	261,522	70,515	1,495,146
9,629,865	School District	18.60%	28,272,662	355,002	4,832,966	1,166,500	914,115	7,268,583
4,765,403	Water Works	9.20%	13,984,328	175,593	2,390,499	576,979	1,041,629	4,184,700
30,061,217	General Fund City Departments	58.04%	88,222,867	1,107,761	15,080,931	3,639,983	1,103,606	20,932,281
<b>\$ 51,787,265</b>	<b>Total for All Employers</b>	<b>100.00%</b>	<b>\$ 152,003,561</b>	<b>\$ 1,908,615</b>	<b>\$ 25,983,686</b>	<b>\$ 6,271,507</b>	<b>\$ 3,795,994</b>	<b>\$ 37,959,802</b>

\* We understand that the recommendation of the American Institute of Certified Public Accountants (AICPA) is for the deferred inflows resulting from the net difference between projected and actual investment earnings on pension plan investments to be shown net of the respective outflows resulting from this difference. Unless instructed otherwise, we will only show the net amount in future reports.

## Schedule of Proportionate Employer Share for Year Ended December 31, 2018 (Concluded)

Employer	Deferred Inflows of Resources				Pension Expense			
	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments*	Changes of Assum.	Changes in Proportion and Differences Between Employer Cont. and Share of Cont.	Total Deferred Inflows of Resources	Prop. Share of Plan Pension Expense	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Employer Pension Expense
Airport	\$ 228,675	\$ 882,867	\$ -	\$ 832,114	\$ 1,943,656	\$ 2,021,358	\$ (109,828)	\$ 1,911,530
Parking Control	29,456	113,725	-	60,483	203,664	260,378	58,227	318,605
Environmental Protection	107,749	415,995	-	375,584	899,328	952,437	(69,511)	882,926
School District	480,605	1,855,518	-	1,151,095	3,487,218	4,248,279	(53,996)	4,194,283
Water Works	237,719	917,783	-	244,877	1,400,379	2,101,299	181,541	2,282,840
General Fund City Departments	1,499,694	5,790,013	-	1,131,841	8,421,548	13,256,457	(6,433)	13,250,024
<b>Total for All Employers</b>	<b>\$ 2,583,898</b>	<b>\$ 9,975,901</b>	<b>\$ -</b>	<b>\$ 3,795,994</b>	<b>\$ 16,355,793</b>	<b>\$ 22,840,208</b>	<b>\$ -</b>	<b>\$ 22,840,208</b>

\* We understand that the recommendation of the American Institute of Certified Public Accountants (AICPA) is for the deferred inflows resulting from the net difference between projected and actual investment earnings on pension plan investments to be shown net of the respective outflows resulting from this difference. Unless instructed otherwise, we will only show the net amount in future reports.

## SECTION C

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### REQUIRED SUPPLEMENTARY INFORMATION

# Schedule of Changes in Net Pension Liability and Related Ratios

## Current Period

### Plan Year Ended December 31, 2018

<b>A. Total Pension Liability</b>	
1. Service cost	\$ 6,361,053
2. Interest on the Total Pension Liability	\$ 23,689,732
3. Changes of benefit terms	\$ -
4. Difference between expected and actual experience of the Total Pension Liability	\$ (172,714)
5. Changes of assumptions	\$ -
6. Benefit payments, including refunds of employee contributions	\$ (18,348,151)
7. Net change in Total Pension Liability	\$ 11,529,920
8. Total Pension Liability – Beginning	344,418,296
9. Total Pension Liability – Ending	<u><u>\$ 355,948,216</u></u>
<b>B. Plan fiduciary net position</b>	
1. Contributions – Employer	\$ 13,113,367
2. Contributions – Employee	2,387,580
3. Net investment income	(11,682,616)
4. Benefit payments, including refunds of employee contributions	(18,348,151)
5. Pension plan administrative expense	(702,533)
6. Other	(59,532)
7. Net change in Plan Fiduciary Net Position	\$ (15,291,885)
8. Plan Fiduciary Net Position – Beginning	219,236,540
9. Plan Fiduciary Net Position – Ending	<u><u>\$ 203,944,655</u></u>
<b>C. Net Pension Liability</b>	<u><u>\$ 152,003,561</u></u>
<b>D. Plan Fiduciary Net Position as a percentage of the Total Pension Liability</b>	<b>57.30%</b>
<b>E. Covered-Employee Payroll</b>	<b>\$ 51,787,265</b>
<b>F. Net Pension Liability as a percentage of Covered-Employee Payroll</b>	<b>293.52%</b>

# Schedules of Required Supplementary Information

## Schedule of Changes in Net Pension Liability and Related Ratios (Multiyear)

(Ultimately 10 Years Will Be Displayed)

Plan Year Ending December 31,	2018	2017	2016	2015	2014
<b>Total Pension Liability</b>					
Service Cost	\$ 6,361,053	\$ 6,341,280	\$ 6,327,991	\$ 6,468,648	\$ 6,589,804
Interest on the Total Pension Liability	23,689,732	22,956,480	22,438,990	21,231,157	20,108,289
Benefit Changes: Buybacks and COLA	-	-	-	-	-
Difference between Expected and Actual Experience Assumption Changes	(172,714)	201,281	(5,201,876)	4,528,433	2,716,119
Benefit Payments	(17,781,112)	(16,605,774)	(15,812,395)	(14,516,835)	(12,335,397)
Refunds	(567,039)	(229,271)	(220,469)	(446,590)	(207,947)
<b>Net Change in Total Pension Liability</b>	<b>11,529,920</b>	<b>22,530,315</b>	<b>7,532,241</b>	<b>17,264,813</b>	<b>16,870,868</b>
<b>Total Pension Liability - Beginning</b>	<b>344,418,296</b>	<b>321,887,981</b>	<b>314,355,740</b>	<b>297,090,927</b>	<b>280,332,479</b>
<b>Prior Year Adjustment</b>	-	-	-	-	(112,420)
<b>Total Pension Liability - Ending (a)</b>	<b>\$ 355,948,216</b>	<b>\$ 344,418,296</b>	<b>\$ 321,887,981</b>	<b>\$ 314,355,740</b>	<b>\$ 297,090,927</b>
<b>Plan Fiduciary Net Position</b>					
Employer and Other Contributions	\$ 13,113,367	\$ 12,221,415	\$ 8,391,456	\$ 11,613,137	\$ 10,959,998
Employee and Add'l Contributions	2,387,580	2,342,148	2,389,882	2,744,956	2,254,021
Pension Plan Net Investment Income	(11,682,616)	30,429,722	11,543,017	(4,783,148)	6,754,397
Benefit Payments	(17,781,112)	(16,605,774)	(15,812,395)	(14,516,835)	(12,335,397)
Refunds	(567,039)	(229,271)	(220,469)	(446,590)	(207,947)
Pension Plan Administrative Expense	(702,533)	(759,927)	(791,762)	(693,329)	(679,116)
Other	(59,532)	(50,612)	(61,856)	(65,963)	(50,008)
<b>Net Change in Plan Fiduciary Net Position</b>	<b>(15,291,885)</b>	<b>27,347,701</b>	<b>5,437,873</b>	<b>(6,147,772)</b>	<b>6,695,948</b>
<b>Plan Fiduciary Net Position - Beginning</b>	<b>219,277,973</b>	<b>191,930,272</b>	<b>186,492,399</b>	<b>192,562,665</b>	<b>185,979,137</b>
<b>Adjustment</b>	<b>(41,433)</b>	<b>-</b>	<b>-</b>	<b>77,506</b>	<b>(112,420)</b>
<b>Plan Fiduciary Net Position - Ending (b)</b>	<b>\$ 203,944,655</b>	<b>\$ 219,277,973</b>	<b>\$ 191,930,272</b>	<b>\$ 186,492,399</b>	<b>\$ 192,562,665</b>
<b>Net Pension Liability - Ending (a) - (b)</b>	<b>152,003,561</b>	<b>125,140,323</b>	<b>129,957,709</b>	<b>127,863,341</b>	<b>104,528,262</b>
<b>Plan Fiduciary Net Position as a Percentage of Total Pension Liability</b>	<b>57.30 %</b>	<b>63.67 %</b>	<b>59.63 %</b>	<b>59.33 %</b>	<b>64.82 %</b>
<b>Covered-Employee Payroll</b>	<b>\$ 51,787,265</b>	<b>\$ 53,364,536</b>	<b>\$ 52,888,074</b>	<b>\$ 52,953,903</b>	<b>\$ 54,267,183</b>
<b>Net Pension Liability as a Percentage of Covered-Employee Payroll</b>	<b>293.52 %</b>	<b>234.50 %</b>	<b>245.72 %</b>	<b>241.46 %</b>	<b>192.62 %</b>
<b>Notes to Schedule:</b>	N/A	N/A	N/A	N/A	N/A

## Schedules of Required Supplementary Information Schedule of the Net Pension Liability

(Ultimately 10 Years Will Be Displayed)

December 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
2014	\$ 297,090,927	\$ 192,562,665	\$ 104,528,262	64.82%	\$ 54,267,183	192.62%
2015	314,355,740	186,492,399	127,863,341	59.33%	52,953,903	241.46%
2016	321,887,981	191,930,272	129,957,709	59.63%	52,888,074	245.72%
2017	344,418,296	219,277,973	125,140,323	63.67%	53,364,536	234.50%
2018	355,948,216	203,944,655	152,003,561	57.30%	51,787,265	293.52%

# Schedule of Contributions

(Ultimately 10 Years Will Be Displayed)

<u>Plan Year Ending December 31,</u>	<u>Actuarially Determined Contribution (ADC) #</u>	<u>Actual Contribution</u>	<u>Contribution Deficiency (Excess)</u>	<u>Covered Payroll</u>	<u>Actual Contribution as a % of Covered Payroll</u>
2014	\$ 10,959,998	\$ 10,959,998	\$ -	\$ 54,267,183	20.20%
2015	11,613,137	11,613,137	-	52,953,903	21.93%
2016	8,391,456	8,391,456	-	52,888,074	15.87%
2017	12,221,415	12,221,415	-	53,364,536	22.90%
2018	13,113,367	13,113,367	-	51,787,265	25.32%

*# Employer contributes based on percent of payroll. Employer pays the ADC percentage.*

## Notes to Schedule of Contributions

**Valuation Date:** December 31, 2016 and December 31, 2017  
**Notes** Actuarially determined contribution rates are calculated as of December 31 for the contribution period starting 6 months later. Actual contributions reported during the plan year are therefore based on two consecutive ADCs.

### Methods and Assumptions Used to Determine Fiscal Year 2018 Contribution Rate:

Actuarial Cost Method	Entry-Age Normal
Amortization Method	Level Percent-of-Payroll, Closed
Remaining Amortization Period	23 years
Asset Valuation Method	5-year smoothed market; 20% corridor
Wage Inflation	3.00%
Salary Increases	3.00% to 7.93% including inflation
Investment Rate of Return	7.25% (net of investment expenses)
Retirement Age	Age and Experience-based table of rates that are specific to the type of eligibility condition.
Mortality	RP-2000 Mortality Table projected to 2020 for males and females.
Expense Load	0.5% of payroll.
COLA Assumption	1.25% compounded annually.

### Other Information:

Notes

### Methods and Assumptions Used to Determine Fiscal Year 2019 Contribution Rate:

Actuarial Cost Method	Entry-Age Normal
Amortization Method	Level Percent-of-Payroll, Closed
Remaining Amortization Period	22 years
Asset Valuation Method	5-year smoothed market; 20% corridor
Wage Inflation	2.75%
Salary Increases	3.75% to 7.43% including inflation
Investment Rate of Return	7% (net of investment expenses)
Retirement Age	Age and Experience-based table of rates that are specific to the type of eligibility condition.
Mortality	RP-2014 Mortality Table projected to 2026 for males and females using projection scale MP-2017.
Expense Load	1.0% of payroll.
COLA Assumption	1.0% compounded annually.

### Other Information:

Notes Economic and demographic assumptions were updated in accordance with an experience study for the 5-year period ended December 31, 2016.



## **SECTION D**

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### **NOTES TO FINANCIAL STATEMENTS**

## Single Discount Rate

A Single Discount Rate of 7.00% 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 7.00%. The projection of cash flows used to determine this Single Discount Rate assumed that plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. 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 periods of projected benefit payments to determine the Total Pension Liability.

Regarding the sensitivity of the Net Pension Liability to changes in the Single Discount Rate, the following presents the plan's Net Pension Liability, calculated using a Single Discount Rate of 7.00%, as well as what the plan's Net Pension Liability would be if it were calculated using a Single Discount Rate that is one percent lower or one percent higher:

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

	1% Decrease 6.00%	Current Single Discount Rate Assumption 7.00%	1% Increase 8.00%
Total Pension Liability (TPL)	\$ 397,345,601	\$ 355,948,216	\$ 320,847,082
Net Position Restricted for Pensions	203,944,655	203,944,655	203,944,655
Net Pension Liability (NPL)	\$ 193,400,946	\$ 152,003,561	\$ 116,902,427

## Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	914
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	109
Active Plan Members	<u>1,142</u>
Total Plan Members	2,165

## SECTION E

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### SUMMARY OF BENEFITS

# Summary of Benefit Provisions as of December 31, 2018

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## Eligibility

## Amount

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### NORMAL RETIREMENT

Members are eligible to retire at age 60.

Straight life pension equals 2.0% of 3-year Final Average Earnings (FAE) times service on and after January 1, 1999 *plus* 1.5% of FAE times service before January 1, 1999.

Members with at least 20 years of service at retirement are eligible for a minimum benefit if employed on or before January 1, 1974.

Minimum benefit for eligible members is 50% of FAE.

### EARLY RETIREMENT

Members are eligible to retire early if the sum of age and service is at least 80, or at age 55 with at least 20 years of service.

Computed as a normal retirement pension. If the early retirement occurs prior to the member attaining age 60, the benefit is reduced by 1/6 of 1% for each month that the early retirement precedes age 60.

### DEFERRED RETIREMENT

Members are eligible to retire with a deferred benefit after attaining at least 5 years of service, provided they do not take a refund of member contributions.

Pension is computed as a normal retirement pension, based on service and FAE on date of termination. Commencement of benefits begins at age 60.

### NON-DUTY DISABILITY

Members are eligible upon attainment of 15 years of service.

Pension is computed as a normal retirement pension based on service and FAE as of date of disability.

### DUTY DISABILITY

No age or service requirement.

Pension is computed as a normal retirement pension based on service and FAE as of date of disability. Minimum duty disability benefit is 50% of FAE.

# Summary of Benefit Provisions as of December 31, 2018

## Eligibility

## Amount

### ORDINARY DEATH-IN-SERVICE

- |  |   |
|--|---|
| (1) Any age with less than 5 years of service. | Beneficiary receives member's contributions and accumulated interest, and an additional lump sum equal to one year's salary.  |
| (2) Any age with 5 or more years of service.   | Beneficiary receives the option of: (1) the greater of (a) 50% of the accrued service retirement benefit (without any early retirement reduction); or (b) pension computed as normal or early retirement benefit (depending on eligibility), actuarially reduced as if the member had elected the 100% Joint & Survivor benefit; or (2) lump sum equal to 100% of base salary plus the member's accumulated contributions (including interest). |

### DUTY DEATH-IN-SERVICE

- |  |   |
|--|---|
| Death as a result of a work-related accident; not caused by willful neglect of the member. | The option of: (1) the greater of (a) 50% of FAE, or (b) pension computed as an early retirement benefit actuarially reduced as if the member had elected the 100% Joint & Survivor benefit; or (2) a lump sum as described below; options payable to the spouse or child(ren) under age 18. If no spouse or child(ren) are alive at the time of the member's death, a lump sum is payable to the member's estate in the amount of 100% of base salary plus the member's accumulated contributions (including interest) plus accrued fringe benefits not paid at the time of death. |
|--|---|

### MEMBER CONTRIBUTIONS

3.75% of pay for service on and after January 1, 1999. 2.5% of pay for service prior to January 1, 1999. Contributions are credited with 5.0% interest per annum. Members may elect to contribute additional contributions which are accounted for separately. At retirement the additional contribution balance is annuitized to provide an additional benefit, within certain limits.

# Summary of Benefit Provisions as of December 31, 2018

## OPTIONAL FORMS OF PAYMENT

In lieu of the straight life benefit, a member may elect an actuarially reduced benefit in one of the following forms:

- 100% Joint & Survivor with pop-up
- 66 2/3 % Joint & Survivor with pop-up
- 50% Joint & Survivor with pop-up
- 10-year Certain & Life Option

The actuarial factors for optional forms of payment are based on the 1983 Group Annuity Mortality Table and 7.5% interest.

## SERVICE UPGRADE

Members may elect to purchase an increase in their benefit multiplier for service rendered before 1999 under Chapter 159 (or Senate Bill 402). The cost to the member is ½ of the actuarially determined increase in System costs and results in a benefit based on 2% of FAE for the time purchased.

## SECTION F

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### **ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS**



## Actuarial Cost Method

**Normal cost and the allocation of benefit values** between service rendered before and after the valuation date was determined using the *individual entry-age actuarial cost method*. GASB Statement Nos. 67 and 68 require the use of this method having the following characteristics:

- the annual normal cost for each individual active member, payable from the date of employment to the date of retirement, are sufficient to accumulate the value of the member's benefit at the time of retirement;
- each annual normal cost is a constant percentage of the member's year-by-year projected covered pay; and
- the use of Market Value of Assets for the Net Position Restricted for Pensions.

## Actuarial Assumptions Used for the Valuation

The contribution requirements and benefit values of the System are calculated by applying actuarial assumptions to the benefit provisions and member information furnished, using the actuarial cost method described on the previous page.

The principal areas of financial risk which require assumptions about future experience are:

- long-term rates of investment return to be generated by the assets of the System,
- patterns of pay increases to members,
- rates of mortality among members, retirees and beneficiaries,
- rates of withdrawal of active members,
- rates of disability among members, and
- the age patterns of actual retirement.

In a valuation, the monetary effect of each assumption is calculated for as long as a present covered person survives - - - a period of time which can be as long as a century.

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Actual experience of the System will not coincide exactly with assumed experience, regardless of the accuracy of the assumptions, or the skill of the actuary and the precision of the many calculations made. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of adjustments (usually small) to the computed contribution rate.

From time-to-time it becomes appropriate to modify one or more of the assumptions, to reflect experience trends (but not random year-to-year fluctuations). The Board has established a policy of performing an experience study every 3-5 years to evaluate/modify valuation assumptions. Assumptions used in this report are based on the January 1, 2012 – December 31, 2016 experience study of the MECS and were adopted by the Board. These assumptions were first used in the December 31, 2017 actuarial valuation. We believe the assumptions are reasonable individually and in the aggregate. Assumptions are forward-looking.

## Actuarial Assumptions Used for the Valuation

**The rate of investment return was 7.00% per year**, compounded annually (net of investment expenses). This assumption is used to make money payable at one point in time equal in value to a different amount of money payable at another point in time. The assumed real rate of return (the net return in excess of the wage inflation rate) is 4.25%. Experience over the last 5 years has been as follows:

	Year Ended December 31					5-Year Average
	2018	2017	2016	2015	2014	
1) Nominal rate of return#	3.4 %	7.4 %	6.3 %	4.8 %	7.4 %	5.8 %
2) Increase in CPI	1.9 %	2.1 %	2.1 %	0.7 %	0.8 %	1.5 %
3) Average Salary Increase (ASI)	(0.1)%	1.2 %	1.1 %	(2.0)%	1.3 %	0.3 %
4) Real Return						
- Total: CPI (1) - (2)						4.3 %
- Total: ASI (1) - (3)						5.5 %
- Assumption	4.25 %	4.25 %	4.25 %	4.25 %	4.25 %	4.3 %

# The nominal rate of return was computed using the approximate formula:  $i = I$  divided by  $\frac{1}{2}(A+B-I)$ , where  $I$  is realized investment income net of expenses,  $A$  is the beginning of year asset funding value and  $B$  is the end of year funding asset value.

**The rate of assumed price inflation** was 2.25% per year. This results in a real rate of return over price inflation of 4.75%.

**The rates of salary increase** used for individual members are in accordance with the following table. This assumption is used to project a member's current salary to the salaries upon which benefit amounts will be based.

Service	Salary Increase Assumptions for an Individual Member		
	Merit & Seniority	Base (Economic)	Increase Next Year
1	3.71%	2.75%	6.46%
2	4.68%	2.75%	7.43%
3	4.47%	2.75%	7.22%
4	3.95%	2.75%	6.70%
5	3.63%	2.75%	6.38%
6	3.18%	2.75%	5.93%
7	2.80%	2.75%	5.55%
8	2.51%	2.75%	5.26%
9	2.31%	2.75%	5.06%
10	2.10%	2.75%	4.85%
15	1.33%	2.75%	4.08%
20	1.02%	2.75%	3.77%
25	1.00%	2.75%	3.75%
30	1.00%	2.75%	3.75%
35	1.00%	2.75%	3.75%
40	1.00%	2.75%	3.75%
Ref:	733		

If the number of active members remains constant, then the total active member payroll will increase 2.75% annually, the base portion of the individual salary increase assumptions. This increasing payroll was recognized in amortizing unfunded actuarial accrued liabilities.

## Actuarial Assumptions Used for the Valuation

*The post-retirement healthy mortality table* was the RP-2014 Mortality Table projected to 2026 using projection scale MP-2017.

Sample Attained Ages	Single Life Retirement Values					
	Present Value of \$1 Monthly for Life		Percent Dying Next Year		Future Life Expectancy (years)	
	Men	Women	Men	Women	Men	Women
50	\$152.48	\$156.61	0.3826%	0.2596%	35.07	37.62
55	145.39	150.10	0.5366%	0.3600%	30.31	32.68
60	136.49	141.81	0.7607%	0.5462%	25.72	27.88
65	125.58	131.52	1.1113%	0.8176%	21.33	23.29
70	112.43	118.88	1.6572%	1.2451%	17.20	18.93
75	97.02	103.77	2.6043%	2.0005%	13.39	14.86
80	79.85	86.49	4.3403%	3.4148%	9.98	11.18
Ref:	2135 x 1.00 sb 0	2136 x 1.00 sb 0				

This assumption is used to measure the probabilities of members dying after retirement. The projection to 2026 is the margin for mortality improvement.

Post-retirement disabled mortality table is the RP-2014 Disabled Retiree Annuitant Table projected to 2026 using projection scale MP-2017.

Pre-retirement mortality is modeled using the RP-2014 Employee Mortality Table projected to 2026 using projection scale MP-2017 and multiplied by a factor of 80%.

These tables were updated for the December 31, 2017 valuation in accordance with an experience study for the System of the 5-year period ended December 31, 2016.

**The rates of retirement** used to measure the probability of eligible members retiring during the next year were updated for the December 31, 2017 valuation and are as follows:

Active Members Retiring Next Year Under Normal Retirement			Active Members Retiring Next Year Under Early Retirement			
Ages	% Retiring		Ages	% Retiring		Rule of 80
	Men	Women		Age and Service		
			Men	Women		
60	10%	10%	50			10%
61	13%	15%	51			4%
62	25%	25%	52			7%
63	15%	12%	53			5%
64	16%	12%	54			5%
65	22%	20%	55	5%	10%	5%
66	30%	25%	56	5%	15%	4%
67	18%	27%	57	5%	8%	8%
68	20%	13%	58	5%	7%	8%
69	20%	20%	59	5%	7%	10%
70	20%	22%				
71	60%	23%				
72	50%	23%				
73	50%	23%				
74	50%	23%				
75	100%	23%				
76	100%	23%				
77	100%	23%				
78	100%	23%				
79	100%	23%				
80	100%	100%				
Ref.	2757	2756		2357	2754	2755

A member was assumed to be eligible for normal retirement after attaining age 60 regardless of years of service. A member was assumed to be eligible for early retirement after attaining age 55 with at least 20 years of service or if the sum of age and service is at least 80.

## Actuarial Assumptions Used for the Valuation

**Rates of separation from active membership** are shown below (rates do not apply to members eligible to retire and do not include separation on account of death or disability). This assumption measures the probabilities of members remaining in employment. These rates were updated for the December 31, 2017 valuation.

Sample Ages	Service	% of Active Members Separating within Next Year	
		Men	Women
	0-1	22.00%	32.00%
	1-2	17.00%	20.00%
	2-3	12.00%	15.00%
	3-4	8.00%	12.00%
	4-5	8.00%	11.00%
	5-6	n/a	9.00%
30	5 & Up (Men)		
	6 & Up (Women)	4.88%	5.57%
35		3.61%	4.67%
40		2.85%	4.04%
45		2.45%	3.57%
50		2.28%	3.10%
Ref.		1106 77 x 0.4275	1105 37 x 1.05

**Rates of disability** were divided equally between duty and non-duty disability and are as follows:

Sample Ages	% of Active Members Becoming Disabled within Next Year	
	Male	Female
20	0.002%	0.002%
25	0.002%	0.002%
30	0.002%	0.002%
35	0.011%	0.011%
40	0.043%	0.043%
45	0.088%	0.088%
50	0.144%	0.144%
55	0.214%	0.214%
60	0.318%	0.318%
Ref.	37 x 0.30	37 x 0.30

## Miscellaneous and Technical Assumptions

<b>Marriage Assumption:</b>	75% of males and 75% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses.
<b>Pay Increase Timing:</b>	Beginning of the year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.
<b>Decrement Timing:</b>	Decrements of all types are assumed to occur mid-year.
<b>Eligibility Testing:</b>	Eligibility for benefits is determined based upon the age nearest birthday and exact fractional service on the date the decrement is assumed to occur.
<b>Decrement Relativity:</b>	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
<b>Decrement Operation:</b>	Disability and withdrawal decrements do not operate after member reaches retirement eligibility.
<b>Administrative Expense Load:</b>	1.00% of payroll.
<b>Normal Form of Benefit:</b>	The assumed normal form of benefit is the straight life form.
<b>Benefit Service:</b>	Exact fractional service as of the valuation date is used to determine the amount of benefit payable.
<b>Incidence of Contributions:</b>	Contributions are assumed to be received continuously throughout the year based upon the actual payroll payable at the time contributions are made.
<b>COLA Assumption:</b>	1.00% compounded annually.
<b>Adjustments:</b>	Normal and Early retirement costs were increased by 10% to reflect lump sums that are payable at retirement but not available in the active data. Retiree liabilities were increased 1% to account for pop-up retiree benefits.

## SECTION G

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### CALCULATION OF THE SINGLE DISCOUNT RATE



## 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 “risk-free” 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 7.00%; the municipal bond rate is 3.71%; and the resulting SDR is 7.00%.

The tables in this section provide background for the development of the SDR.

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). Administrative expenses were projected at the current level of 1.36% of payroll.

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 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 Ending December 31, 2118

Year	Payroll for Current Employees	Contributions from		Administrative		UAL Contributions	Total Contributions
		Current Employees	Service Cost Contributions	Expense Contributions			
0	\$ 51,787,265						
1	54,260,716	\$ 2,034,777	\$ 4,657,608	\$ 736,087	\$ 10,151,073	\$ 17,579,545	
2	51,279,750	1,922,991	4,381,699	695,648	10,651,635	17,651,972	
3	48,838,511	1,831,444	4,148,840	662,531	11,142,180	17,784,995	
4	46,545,483	1,745,456	3,928,880	631,424	11,969,931	18,275,691	
5	44,401,758	1,665,066	3,725,124	602,343	12,299,105	18,291,637	
6	42,205,983	1,582,724	3,518,537	572,556	12,637,330	18,311,147	
7	40,145,449	1,505,454	3,321,696	544,603	12,984,856	18,356,609	
8	38,060,447	1,427,267	3,122,943	516,318	13,341,940	18,408,468	
9	35,913,433	1,346,754	2,920,393	487,193	13,708,843	18,463,183	
10	33,841,274	1,269,048	2,724,802	459,082	14,085,837	18,538,768	
11	31,765,347	1,191,200	2,532,435	430,921	14,473,197	18,627,754	
12	29,773,761	1,116,516	2,348,529	403,903	14,871,210	18,740,158	
13	27,848,628	1,044,324	2,171,190	377,787	15,280,168	18,873,469	
14	26,053,215	976,996	2,008,272	353,431	15,700,373	19,039,071	
15	24,337,873	912,670	1,853,597	330,161	16,132,133	19,228,562	
16	22,740,739	852,778	1,709,598	308,495	16,575,767	19,446,637	
17	21,232,488	796,218	1,574,547	288,035	17,031,600	19,690,400	
18	19,750,684	740,651	1,442,869	267,933	17,499,969	19,951,422	
19	18,400,264	690,010	1,325,330	249,613	17,981,219	20,246,171	
20	17,098,784	641,204	1,212,167	231,958	18,475,702	20,561,032	
21	15,935,596	597,585	1,114,553	216,178	18,983,784	20,912,100	
22	14,761,061	553,540	1,015,863	200,245	-	1,769,648	
23	13,692,132	513,455	928,985	185,744	-	1,628,184	
24	12,710,092	476,628	849,249	172,422	-	1,498,300	
25	11,733,938	440,023	772,635	159,180	-	1,371,838	
26	10,830,598	406,147	703,840	146,925	-	1,256,912	
27	9,910,445	371,642	635,111	134,443	-	1,141,196	
28	9,083,459	340,630	573,798	123,224	-	1,037,652	
29	8,252,395	309,465	514,718	111,950	-	936,132	
30	7,455,824	279,593	459,379	101,144	-	840,116	
31	6,675,474	250,330	406,220	90,558	-	747,109	
32	5,964,675	223,675	357,761	80,915	-	662,351	
33	5,304,304	198,911	314,455	71,957	-	585,323	
34	4,671,789	175,192	274,072	63,376	-	512,640	
35	4,064,721	152,427	235,566	55,141	-	443,134	
36	3,472,342	130,213	198,573	47,105	-	375,891	
37	2,965,232	111,196	167,895	40,226	-	319,318	
38	2,462,334	92,338	137,850	33,403	-	263,591	
39	2,012,934	75,485	111,390	27,307	-	214,182	
40	1,634,936	61,310	89,691	22,179	-	173,180	
41	1,297,979	48,674	70,361	17,608	-	136,643	
42	1,009,279	37,848	54,265	13,692	-	105,805	
43	778,897	29,209	41,523	10,566	-	81,297	
44	603,600	22,635	31,900	8,188	-	62,723	
45	455,141	17,068	23,784	6,174	-	47,026	
46	342,540	12,845	17,646	4,647	-	35,139	
47	242,644	9,099	12,337	3,292	-	24,729	
48	163,223	6,121	8,224	2,214	-	16,558	
49	112,757	4,228	5,578	1,530	-	11,336	
50	75,391	2,827	3,625	1,023	-	7,475	

# Single Discount Rate Development

## Projection of Contributions Ending December 31, 2118

### (Concluded)

Year	Payroll for Current Employees	Contributions from Current Employees	Service Cost Contributions	Administrative Expense Contributions	UAL Contributions	Total Contributions
51	\$ 49,106	\$ 1,841	\$ 2,356	\$ 666	-	\$ 4,864
52	31,172	1,169	1,449	423	-	3,041
53	21,111	792	941	286	-	2,018
54	13,441	504	593	182	-	1,279
55	8,982	337	403	122	-	862
56	5,329	200	214	72	-	486
57	3,022	113	119	41	-	273
58	1,704	64	55	23	-	142
59	952	36	35	13	-	84
60	366	14	14	5	-	33
61	-	-	-	-	-	-
62	-	-	-	-	-	-
63	-	-	-	-	-	-
64	-	-	-	-	-	-
65	-	-	-	-	-	-
66	-	-	-	-	-	-
67	-	-	-	-	-	-
68	-	-	-	-	-	-
69	-	-	-	-	-	-
70	-	-	-	-	-	-
71	-	-	-	-	-	-
72	-	-	-	-	-	-
73	-	-	-	-	-	-
74	-	-	-	-	-	-
75	-	-	-	-	-	-
76	-	-	-	-	-	-
77	-	-	-	-	-	-
78	-	-	-	-	-	-
79	-	-	-	-	-	-
80	-	-	-	-	-	-
81	-	-	-	-	-	-
82	-	-	-	-	-	-
83	-	-	-	-	-	-
84	-	-	-	-	-	-
85	-	-	-	-	-	-
86	-	-	-	-	-	-
87	-	-	-	-	-	-
88	-	-	-	-	-	-
89	-	-	-	-	-	-
90	-	-	-	-	-	-
91	-	-	-	-	-	-
92	-	-	-	-	-	-
93	-	-	-	-	-	-
94	-	-	-	-	-	-
95	-	-	-	-	-	-
96	-	-	-	-	-	-
97	-	-	-	-	-	-
98	-	-	-	-	-	-
99	-	-	-	-	-	-
100	-	-	-	-	-	-

# Single Discount Rate Development Projection of Plan Fiduciary Net Position Ending December 31, 2118

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.00%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
1	\$ 203,944,655	\$ 17,579,545	\$ 20,104,766	\$ 736,087	\$ 14,163,911	\$ 214,847,258
2	214,847,258	17,651,972	21,151,045	695,648	14,894,976	225,547,513
3	225,547,513	17,784,995	22,258,883	662,531	15,611,592	236,022,685
4	236,022,685	18,275,691	23,406,607	631,424	16,323,317	246,583,663
5	246,583,663	18,291,637	24,673,518	602,343	17,020,543	256,619,982
6	256,619,982	18,311,147	25,872,957	572,556	17,683,511	266,169,127
7	266,169,127	18,356,609	27,032,767	544,603	18,314,571	275,262,937
8	275,262,937	18,408,468	28,231,785	516,318	18,912,639	283,835,941
9	283,835,941	18,463,183	29,374,699	487,193	19,476,309	291,913,540
10	291,913,540	18,538,768	30,454,478	459,082	20,008,155	299,546,903
11	299,546,903	18,627,754	31,528,377	430,921	20,509,571	306,724,930
12	306,724,930	18,740,158	32,506,844	403,903	20,983,163	313,537,504
13	313,537,504	18,873,469	33,409,010	377,787	21,434,487	320,058,663
14	320,058,663	19,039,071	34,184,428	353,431	21,870,823	326,430,699
15	326,430,699	19,228,562	34,834,743	330,161	22,301,811	332,796,166
16	332,796,166	19,446,637	35,374,567	308,495	22,737,068	339,296,810
17	339,296,810	19,690,400	35,798,681	288,035	23,186,612	346,087,106
18	346,087,106	19,951,422	36,107,194	267,933	23,660,990	353,324,392
19	353,324,392	20,246,171	36,321,942	249,613	24,170,983	361,169,991
20	361,169,991	20,561,032	36,399,811	231,958	24,728,937	369,828,190
21	369,828,190	20,912,100	36,321,281	216,178	25,350,335	379,553,166
22	379,553,166	1,769,648	36,150,928	200,245	25,378,839	370,350,481
23	370,350,481	1,628,184	35,886,634	185,744	24,739,376	360,645,664
24	360,645,664	1,498,300	35,545,111	172,422	24,067,780	350,494,210
25	350,494,210	1,371,838	35,104,984	159,180	23,368,426	339,970,310
26	339,970,310	1,256,912	34,551,580	146,925	22,647,262	329,175,979
27	329,175,979	1,141,196	33,956,206	134,443	21,908,592	318,135,118
28	318,135,118	1,037,652	33,300,151	123,224	21,155,129	306,904,524
29	306,904,524	936,132	32,628,394	111,950	20,388,996	295,489,308
30	295,489,308	840,116	31,904,103	101,144	19,611,920	283,936,098
31	283,936,098	747,109	31,120,551	90,558	18,827,320	272,299,417
32	272,299,417	662,351	30,272,004	80,915	18,039,365	260,648,215
33	260,648,215	585,323	29,411,595	71,957	17,251,044	249,001,029
34	249,001,029	512,640	28,531,621	63,376	16,463,813	237,382,486
35	237,382,486	443,134	27,656,852	55,141	15,678,506	225,792,133
36	225,792,133	375,891	26,792,125	47,105	14,894,898	214,223,692
37	214,223,692	319,318	25,867,731	40,226	14,115,203	202,750,256
38	202,750,256	263,591	24,904,218	33,403	13,343,533	191,419,759
39	191,419,759	214,182	23,915,363	27,307	12,582,932	180,274,204
40	180,274,204	173,180	22,906,552	22,179	11,836,220	169,354,873
41	169,354,873	136,643	21,886,213	17,608	11,105,875	158,693,571
42	158,693,571	105,805	20,853,086	13,692	10,394,206	148,326,804
43	148,326,804	81,297	19,815,450	10,566	9,703,499	138,285,584
44	138,285,584	62,723	18,786,649	8,188	9,035,456	128,588,926
45	128,588,926	47,026	17,774,036	6,174	8,391,061	119,246,803
46	119,246,803	35,139	16,783,058	4,647	7,770,853	110,265,090
47	110,265,090	24,729	15,819,222	3,292	7,174,985	101,642,290
48	101,642,290	16,558	14,872,490	2,214	6,603,721	93,387,865
49	93,387,865	11,336	13,944,060	1,530	6,057,700	85,511,312
50	85,511,312	7,475	13,040,704	1,023	5,537,309	78,014,369

# Single Discount Rate Development Projection of Plan Fiduciary Net Position Ending December 31, 2118 (Concluded)

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.00%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
51	\$ 78,014,369	\$ 4,864	\$ 12,162,876	\$ 666	\$ 5,042,649	\$ 70,898,340
52	70,898,340	3,041	11,310,345	423	4,573,807	64,164,419
53	64,164,419	2,018	10,484,677	286	4,130,812	57,812,286
54	57,812,286	1,279	9,687,030	182	3,713,586	51,839,939
55	51,839,939	862	8,917,249	122	3,321,996	46,245,427
56	46,245,427	486	8,175,816	72	2,955,880	41,025,905
57	41,025,905	273	7,462,555	41	2,615,049	36,178,631
58	36,178,631	142	6,778,184	23	2,299,284	31,699,850
59	31,699,850	84	6,123,618	13	2,008,290	27,584,593
60	27,584,593	33	5,499,688	5	1,741,689	23,826,623
61	23,826,623	-	4,907,158	-	1,499,018	20,418,483
62	20,418,483	-	4,347,291	-	1,279,712	17,350,903
63	17,350,903	-	3,821,526	-	1,083,072	14,612,449
64	14,612,449	-	3,331,007	-	908,258	12,189,699
65	12,189,699	-	2,876,761	-	754,295	10,067,233
66	10,067,233	-	2,459,666	-	620,074	8,227,641
67	8,227,641	-	2,080,454	-	504,351	6,651,537
68	6,651,537	-	1,739,607	-	405,751	5,317,681
69	5,317,681	-	1,437,113	-	322,789	4,203,357
70	4,203,357	-	1,172,330	-	253,897	3,284,925
71	3,284,925	-	943,930	-	197,466	2,538,461
72	2,538,461	-	749,855	-	151,891	1,940,498
73	1,940,498	-	587,499	-	115,620	1,468,618
74	1,468,618	-	453,933	-	87,184	1,101,869
75	1,101,869	-	345,977	-	65,226	821,119
76	821,119	-	260,305	-	48,522	609,336
77	609,336	-	193,595	-	35,992	451,734
78	451,734	-	142,652	-	26,713	335,795
79	335,795	-	104,491	-	19,910	251,214
80	251,214	-	76,420	-	14,956	189,749
81	189,749	-	56,105	-	11,352	144,996
82	144,996	-	41,588	-	8,719	112,127
83	112,127	-	31,283	-	6,773	87,617
84	87,617	-	23,960	-	5,309	68,966
85	68,966	-	18,691	-	4,184	54,460
86	54,460	-	14,809	-	3,303	42,953
87	42,953	-	11,856	-	2,599	33,696
88	33,696	-	9,535	-	2,031	26,192
89	26,192	-	7,657	-	1,570	20,105
90	20,105	-	6,109	-	1,197	15,193
91	15,193	-	4,825	-	897	11,265
92	11,265	-	3,756	-	659	8,168
93	8,168	-	2,869	-	473	5,772
94	5,772	-	2,143	-	330	3,959
95	3,959	-	1,563	-	223	2,619
96	2,619	-	1,110	-	145	1,654
97	1,654	-	767	-	89	977
98	977	-	514	-	51	514
99	514	-	334	-	24	204
100	204	-	211	-	7	-

# Single Discount Rate Development

## Present Values of Projected Benefits Ending December 31, 2118

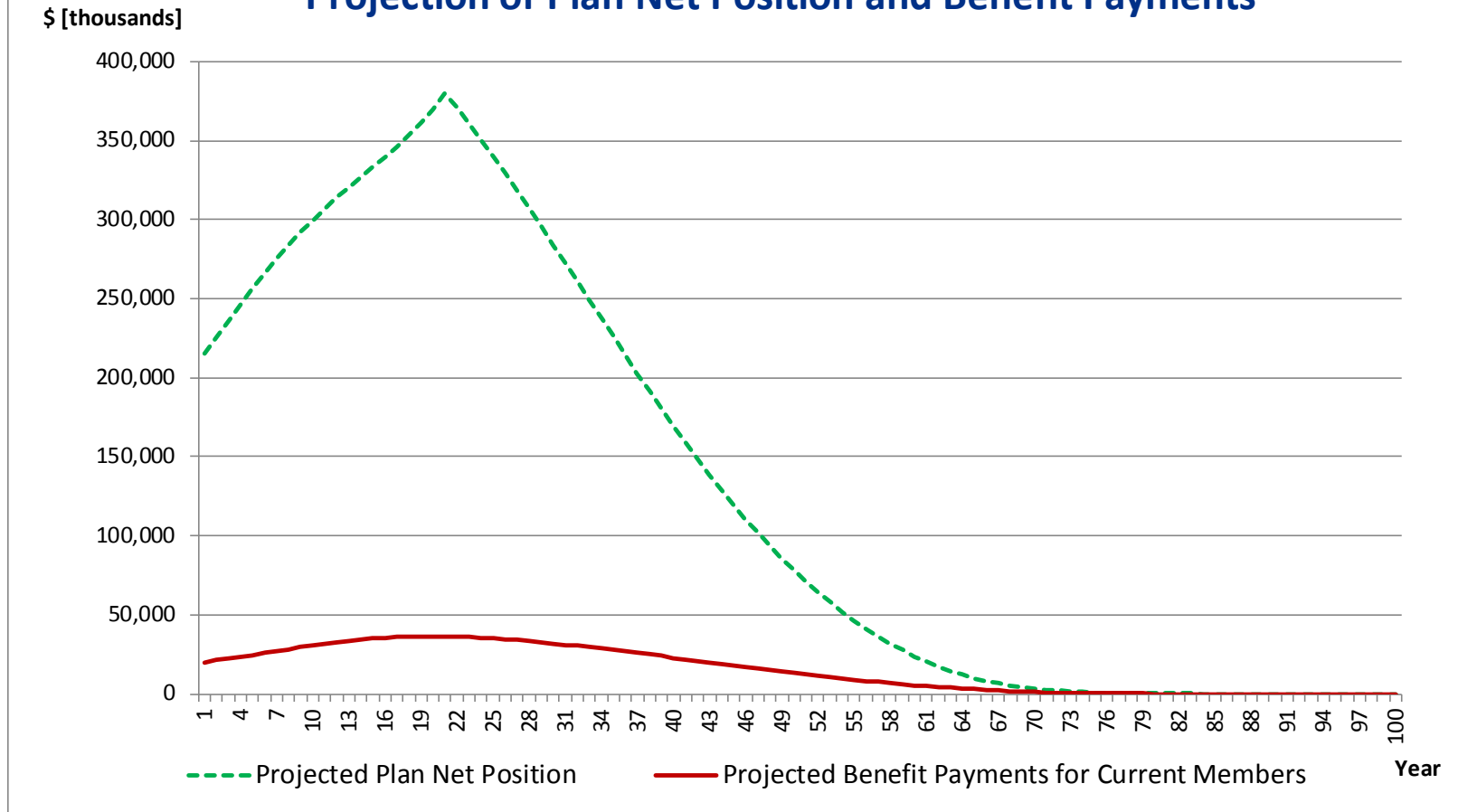
Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value 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	\$ 203,944,655	\$ 20,104,766	\$ 20,104,766	\$ -	\$ 19,436,011	\$ -	\$ 19,436,011
2	214,847,258	21,151,045	21,151,045	-	19,109,801	-	19,109,801
3	225,547,513	22,258,883	22,258,883	-	18,795,069	-	18,795,069
4	236,022,685	23,406,607	23,406,607	-	18,471,205	-	18,471,205
5	246,583,663	24,673,518	24,673,518	-	18,197,179	-	18,197,179
6	256,619,982	25,872,957	25,872,957	-	17,833,447	-	17,833,447
7	266,169,127	27,032,767	27,032,767	-	17,413,896	-	17,413,896
8	275,262,937	28,231,785	28,231,785	-	16,996,520	-	16,996,520
9	283,835,941	29,374,699	29,374,699	-	16,527,658	-	16,527,658
10	291,913,540	30,454,478	30,454,478	-	16,014,201	-	16,014,201
11	299,546,903	31,528,377	31,528,377	-	15,494,299	-	15,494,299
12	306,724,930	32,506,844	32,506,844	-	14,930,054	-	14,930,054
13	313,537,504	33,409,010	33,409,010	-	14,340,569	-	14,340,569
14	320,058,663	34,184,428	34,184,428	-	13,713,469	-	13,713,469
15	326,430,699	34,834,743	34,834,743	-	13,060,140	-	13,060,140
16	332,796,166	35,374,567	35,374,567	-	12,394,887	-	12,394,887
17	339,296,810	35,798,681	35,798,681	-	11,722,890	-	11,722,890
18	346,087,106	36,107,194	36,107,194	-	11,050,391	-	11,050,391
19	353,324,392	36,321,942	36,321,942	-	10,388,891	-	10,388,891
20	361,169,991	36,399,811	36,399,811	-	9,730,059	-	9,730,059
21	369,828,190	36,321,281	36,321,281	-	9,073,894	-	9,073,894
22	379,553,166	36,150,928	36,150,928	-	8,440,501	-	8,440,501
23	370,350,481	35,886,634	35,886,634	-	7,830,648	-	7,830,648
24	360,645,664	35,545,111	35,545,111	-	7,248,716	-	7,248,716
25	350,494,210	35,104,984	35,104,984	-	6,690,618	-	6,690,618
26	339,970,310	34,551,580	34,551,580	-	6,154,341	-	6,154,341
27	329,175,979	33,956,206	33,956,206	-	5,652,610	-	5,652,610
28	318,135,118	33,300,151	33,300,151	-	5,180,746	-	5,180,746
29	306,904,524	32,628,394	32,628,394	-	4,744,146	-	4,744,146
30	295,489,308	31,904,103	31,904,103	-	4,335,359	-	4,335,359
31	283,936,098	31,120,551	31,120,551	-	3,952,229	-	3,952,229
32	272,299,417	30,272,004	30,272,004	-	3,592,958	-	3,592,958
33	260,648,215	29,411,595	29,411,595	-	3,262,465	-	3,262,465
34	249,001,029	28,531,621	28,531,621	-	2,957,807	-	2,957,807
35	237,382,486	27,656,852	27,656,852	-	2,679,553	-	2,679,553
36	225,792,133	26,792,125	26,792,125	-	2,425,957	-	2,425,957
37	214,223,692	25,867,731	25,867,731	-	2,189,024	-	2,189,024
38	202,750,256	24,904,218	24,904,218	-	1,969,615	-	1,969,615
39	191,419,759	23,915,363	23,915,363	-	1,767,671	-	1,767,671
40	180,274,204	22,906,552	22,906,552	-	1,582,343	-	1,582,343
41	169,354,873	21,886,213	21,886,213	-	1,412,953	-	1,412,953
42	158,693,571	20,853,086	20,853,086	-	1,258,182	-	1,258,182
43	148,326,804	19,815,450	19,815,450	-	1,117,361	-	1,117,361
44	138,285,584	18,786,649	18,786,649	-	990,045	-	990,045
45	128,588,926	17,774,036	17,774,036	-	875,403	-	875,403
46	119,246,803	16,783,058	16,783,058	-	772,519	-	772,519
47	110,265,090	15,819,222	15,819,222	-	680,518	-	680,518
48	101,642,290	14,872,490	14,872,490	-	597,935	-	597,935
49	93,387,865	13,944,060	13,944,060	-	523,933	-	523,933
50	85,511,312	13,040,704	13,040,704	-	457,935	-	457,935

# Single Discount Rate Development

## Present Values of Projected Benefits Ending December 31, 2118 (Concluded)

Year	Projected		Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of	Present Value of	Present Value of
	Beginning Plan Net Position	Projected Benefit Payments			Funded Benefit Payments using Expected Return Rate (v)	Unfunded Benefit Payments using Municipal Bond Rate (vf)	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)
51	\$ 78,014,369	\$ 12,162,876	\$ 12,162,876	\$ -	\$ 399,168	\$ -	\$ 399,168
52	70,898,340	11,310,345	11,310,345	-	346,906	-	346,906
53	64,164,419	10,484,677	10,484,677	-	300,543	-	300,543
54	57,812,286	9,687,030	9,687,030	-	259,513	-	259,513
55	51,839,939	8,917,249	8,917,249	-	223,262	-	223,262
56	46,245,427	8,175,816	8,175,816	-	191,307	-	191,307
57	41,025,905	7,462,555	7,462,555	-	163,194	-	163,194
58	36,178,631	6,778,184	6,778,184	-	138,531	-	138,531
59	31,699,850	6,123,618	6,123,618	-	116,965	-	116,965
60	27,584,593	5,499,688	5,499,688	-	98,176	-	98,176
61	23,826,623	4,907,158	4,907,158	-	81,867	-	81,867
62	20,418,483	4,347,291	4,347,291	-	67,782	-	67,782
63	17,350,903	3,821,526	3,821,526	-	55,687	-	55,687
64	14,612,449	3,331,007	3,331,007	-	45,363	-	45,363
65	12,189,699	2,876,761	2,876,761	-	36,614	-	36,614
66	10,067,233	2,459,666	2,459,666	-	29,258	-	29,258
67	8,227,641	2,080,454	2,080,454	-	23,128	-	23,128
68	6,651,537	1,739,607	1,739,607	-	18,074	-	18,074
69	5,317,681	1,437,113	1,437,113	-	13,954	-	13,954
70	4,203,357	1,172,330	1,172,330	-	10,638	-	10,638
71	3,284,925	943,930	943,930	-	8,005	-	8,005
72	2,538,461	749,855	749,855	-	5,943	-	5,943
73	1,940,498	587,499	587,499	-	4,352	-	4,352
74	1,468,618	453,933	453,933	-	3,143	-	3,143
75	1,101,869	345,977	345,977	-	2,238	-	2,238
76	821,119	260,305	260,305	-	1,574	-	1,574
77	609,336	193,595	193,595	-	1,094	-	1,094
78	451,734	142,652	142,652	-	753	-	753
79	335,795	104,491	104,491	-	516	-	516
80	251,214	76,420	76,420	-	353	-	353
81	189,749	56,105	56,105	-	242	-	242
82	144,996	41,588	41,588	-	168	-	168
83	112,127	31,283	31,283	-	118	-	118
84	87,617	23,960	23,960	-	84	-	84
85	68,966	18,691	18,691	-	61	-	61
86	54,460	14,809	14,809	-	46	-	46
87	42,953	11,856	11,856	-	34	-	34
88	33,696	9,535	9,535	-	26	-	26
89	26,192	7,657	7,657	-	19	-	19
90	20,105	6,109	6,109	-	14	-	14
91	15,193	4,825	4,825	-	11	-	11
92	11,265	3,756	3,756	-	8	-	8
93	8,168	2,869	2,869	-	5	-	5
94	5,772	2,143	2,143	-	4	-	4
95	3,959	1,563	1,563	-	3	-	3
96	2,619	1,110	1,110	-	2	-	2
97	1,654	767	767	-	1	-	1
98	977	514	514	-	1	-	1
99	514	334	334	-	-	-	-
100	204	211	211	-	-	-	-
<b>Totals</b>					\$ 408,687,369	\$ -	\$ 408,687,369

## Projection of Plan Net Position and Benefit Payments





## **SECTION H**

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### **GLOSSARY OF TERMS**

## Glossary of Terms

<b><i>Actuarial Accrued Liability (AAL)</i></b>	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as “accrued liability” or “actuarial liability.”
<b><i>Actuarial Assumptions</i></b>	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
<b><i>Accrued Service</i></b>	Service credited under the system which was rendered before the date of the actuarial valuation.
<b><i>Actuarial Equivalent</i></b>	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
<b><i>Actuarial Cost Method</i></b>	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
<b><i>Actuarial Gain (Loss)</i></b>	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
<b><i>Actuarial Present Value (APV)</i></b>	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future payments at predetermined rates of interest and probabilities of payment.
<b><i>Actuarial Valuation</i></b>	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, Total Pension Liability, and related actuarial present value of projected benefit payments for pensions.
<b><i>Actuarial Valuation Date</i></b>	The date as of which an actuarial valuation is performed.
<b><i>Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)</i></b>	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

# Glossary of Terms

<b><i>Amortization Payment</i></b>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<b><i>Amortization Method</i></b>	The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be “open” (meaning, reset each year) or “closed” (the number of years remaining will decline each year).
<b><i>Cost-of-Living Adjustments</i></b>	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
<b><i>Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)</i></b>	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
<b><i>Covered-Employee Payroll</i></b>	The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.
<b><i>Deferred Retirement Option Program (DROP)</i></b>	A program that permits a plan member to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The plan member continues to provide service to the employer and is paid for the service by the employer after the DROP entry date; however, the pensions that would have been paid to the plan member are credited to an individual member account within the defined benefit pension plan until the end of the DROP period. Other variations for DROP exist and will be more fully detailed in the plan provision section of the valuation report.
<b><i>Deferred Inflows and Outflows</i></b>	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.
<b><i>Discount Rate</i></b>	For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically: <ol style="list-style-type: none"><li>1. The benefit payments to be made while the pension plans’ fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and</li><li>2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.</li></ol>

## Glossary of Terms

<b><i>Entry Age Actuarial Cost Method (EAN)</i></b>	The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.
<b><i>GASB</i></b>	The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.
<b><i>Fiduciary Net Position</i></b>	The fiduciary net position is the market value of the assets of the trust dedicated to the defined benefit provisions.
<b><i>Long-Term Expected Rate of Return</i></b>	The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.
<b><i>Money-Weighted Rate of Return</i></b>	The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.
<b><i>Multiple-Employer Defined Benefit Pension Plan</i></b>	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
<b><i>Municipal Bond Rate</i></b>	The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.
<b><i>Net Pension Liability (NPL)</i></b>	The NPL is the liability of employers and non-employer contribution entities to plan members for benefits provided through a defined benefit pension plan.
<b><i>Non-Employer Contribution Entities</i></b>	Non-employer contribution entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB accounting statements, plan members are not considered non-employer contribution entities.
<b><i>Normal Cost</i></b>	The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method. The Normal Cost may also be referred to as "Service Cost."

## Glossary of Terms

<b><i>Other Postemployment Benefits (OPEB)</i></b>	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other postemployment benefits do not include termination benefits.
<b><i>Real Rate of Return</i></b>	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
<b><i>Service Cost</i></b>	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year. The Service Cost may also be referred to as the “Normal Cost.”
<b><i>Total Pension Expense</i></b>	The total pension expense is the sum of the following items that are recognized at the end of the employer’s fiscal year: <ol style="list-style-type: none"><li>1. Service Cost</li><li>2. Interest on the Total Pension Liability</li><li>3. Current-Period Benefit Changes</li><li>4. Employee Contributions (made negative for addition here)</li><li>5. Projected Earnings on Plan Investments (made negative for addition here)</li><li>6. Pension Plan Administrative Expense</li><li>7. Other Changes in Plan Fiduciary Net Position</li><li>8. Recognition of Outflow (Inflow) of Resources due to Liabilities</li><li>9. Recognition of Outflow (Inflow) of Resources due to Assets</li></ol>
<b><i>Total Pension Liability (TPL)</i></b>	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
<b><i>Unfunded Actuarial Accrued Liability (UAAL)</i></b>	The UAAL is the difference between actuarial accrued liability and valuation assets.
<b><i>Valuation Assets</i></b>	The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of GASB Statement Nos. 67 and 68, the valuation assets are equal to the market value of assets.