

# City of Manchester Employees' Contributory Retirement System

GASB Statement No. 74, Financial Reporting for  
Postemployment Benefit Plans Other Than Pension Plans  
December 31, 2018



April 26, 2019

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

Dear Board Members:

This report provides information on behalf of the City of Manchester Employees' Contributory Retirement System (MECRS) in connection with the Governmental Accounting Standards Board (GASB) Statement No. 74. GASB Statement No. 74 is the accounting standard, which applies to Other Postemployment Benefits (OPEB) plans that are administered through trusts or equivalent arrangements.

The calculation of the liability associated with the post-retirement health subsidy benefits described in this report was performed for the purpose of satisfying the requirements of GASB Statement No. 74. The calculation of the System's liability for this report is not applicable for funding purposes of the Plan. A calculation of the Plan's liability for purposes other than satisfying the requirements of GASB Statement No. 74 may produce significantly different results. This report may be provided to parties other than the MECRS only in its entirety and only with the permission of the MECRS. GRS is not responsible for unauthorized use of this report.

This report is based upon information, furnished to us by MECRS, concerning other postemployment benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. This information was checked for internal consistency, but it was not audited.

The data, actuarial assumptions, and benefit provisions used in this report are the same as those used in the December 31, 2018 actuarial valuation unless otherwise noted. Please refer to this valuation for additional discussion regarding the data, assumptions, benefit provisions, and the nature of actuarial calculations.

Based on the available data, the information contained in this report is accurate and fairly represents the actuarial position of the Retiree Health Subsidy provided by the City of Manchester Employees' Contributory Retirement System as of the reporting date. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as the Actuarial Standards of Practice. If you have reason to believe that the information provided in this report is inaccurate, or is in any way incomplete, or if you need further information in order to make an informed decision on the subject matter of this report, please contact the authors of the report prior to making such decision.

Board of Trustees

April 26, 2019

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Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

Section G of the report details the calculation of the single discount rate and is not required to be included in your financial statements. However, this information may be requested by your auditors, therefore, we have included it in this report.

The benefits provided by MECRS are dollar benefits. Although the City may provide health insurance access, MECRS does not. The liabilities computed herein are based on the dollar benefits, not claims costs or premiums. Therefore, this report may not be suitable for the City's reporting under GASB Statement No. 75.

The signing individuals are independent of the plan sponsor.

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.

Respectfully submitted,



Kenneth G. Alberts



Heidi G. Barry, ASA, FCA, MAAA

KGA/HGB:sc



Auditor's Note – This information is intended to assist in preparation of the financial statements of the Retiree Health Subsidy provided by the City of Manchester Employees' Contributory Retirement System. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

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# SECTION A

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## EXECUTIVE SUMMARY

# Executive Summary as of December 31, 2018

Actuarial Valuation Date/Measurement Date	December 31, 2018
OPEB Plan's Fiscal Year Ending Date (Reporting Date)	December 31, 2018

## Membership

Number of	
- Retirees and Beneficiaries	354
- Inactive, Nonretired Members	109
- Active Members	1,142
- Total	1,605
Covered Payroll	\$ 51,787,265

## Net OPEB Liability

Total OPEB Liability	\$ 28,712,126
Plan Fiduciary Net Position	12,268,459
Net OPEB Liability	\$ 16,443,667
Plan Fiduciary Net Position as a Percentage of Total OPEB Liability	42.73 %
Net OPEB Liability as a Percentage of Covered Payroll	31.75 %

## Development of the Single Discount Rate

Single Discount Rate	7.00 %
Long-Term Expected Rate of 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

*\*Source: "20-Year Municipal Go AA Index" is the Fidelity Index, general obligation, 20 years to maturity, mixed quality. 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. The rate shown is as of December 28, 2018, the most recent date available on or before the measurement date.*

# Discussion

## Accounting Standard

For post-employment (OPEB) benefit plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 74, “Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans,” replaces the requirements of GASB Statement No. 43, “Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans.” GASB Statement No. 74 establishes standards of financial reporting for separately issued financial reports of state and local government OPEB plans.

Reporting under GASB Statement No. 74 is effective for plan fiscal years commencing after June 15, 2016.

The following discussion provides a summary of the information that is required to be disclosed under this new accounting standard. 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 internal staff will be responsible for preparing that information to comply with this accounting standard.

## Financial Statements

GASB Statement No. 74 requires defined benefit OPEB plans which are administered as trusts or equivalent arrangements to present two financial statements: a statement of fiduciary net position and a statement of changes in fiduciary net position. The statement of fiduciary net position presents the assets and liabilities of the OPEB plan at the end of the OPEB 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 expense, and net increase or decrease in the fiduciary net position.



# Discussion

## Notes to Financial Statements

GASB Statement No. 74 requires the notes of the financial statements for employers and OPEB plans to include certain additional information. The list of disclosure items should include:

- The name of the OPEB plan, the administrator of the OPEB plan, and the identification of whether the OPEB plan is a single-employer, agent, or cost-sharing OPEB plan;
- A description of the benefits provided by the plan;
- A brief description of changes in benefit terms or assumptions that affected the measurement of the total OPEB liability since the prior measurement date;
- The number of plan members by category and if the plan is closed;
- A description of the plan's funding policy, which includes member and employer contribution requirements;
- The OPEB plan's investment policies;
- The OPEB plan's fiduciary net position and the net pension liability;
- The net OPEB liability using +/- 1% on the discount rate;
- The net OPEB liability using +/- 1% on the healthcare trend rate (if applicable);
- 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.

OPEB plans that are administered through trusts or equivalent arrangements are required to disclose additional information in accordance with GASB Statement No. 74. This information includes:

- The composition of the OPEB 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.

# Discussion

## Required Supplementary Information

GASB Statement No. 74 requires a 10-year fiscal history of:

- Sources of changes in the net OPEB liability.
- Information about the components of the net OPEB liability and related ratios, including the OPEB plan's fiduciary net position as a percentage of the total OPEB liability, and the net OPEB liability as a percent of covered-employee payroll.
- Comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.
- For plans with an actuarially determined contribution, the schedule covering each of the 10 most recent fiscal years of the actuarially determined contribution, contributions to the OPEB plan and related ratios.

## Frequency and Timing of the Actuarial Valuation

An actuarial valuation to determine the total OPEB liability is required to be performed at least every two years. For the employer's financial reporting purposes, the net OPEB liability and OPEB expense should be measured as of the employer's "measurement date," which may not be earlier than the employer's prior fiscal year end-date. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total OPEB liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total OPEB 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.

# Discussion

## 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 OPEB 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 OPEB plan investments is 7.00%; the municipal bond rate is 3.71% (based on the weekly 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%.

## Actuarial Assumptions

The actuarial assumptions and methods used to value the liabilities are outlined in Section F.

## Future Uncertainty or Risk

Future results may differ from those anticipated in this valuation. Reasons include, but are not limited to:

- Actual medical trend differing from expected;
- Changes in the healthcare plan designs offered to active and retired members; and
- Participant behavior differing from expected, e.g.,
  - Elections at retirement; and
  - Time of retirement or termination.

## Benefits Valued

The benefit provisions that were valued are described in the December 31, 2018 actuarial valuation report. The valuation is required to be performed on the current benefit terms and existing legal agreements. Consideration is to be given to the written plan document as well as other communications between the employer and plan members and an established pattern of practice for cost sharing. The summary of major plan provisions is designed to outline principal plan benefits. If the plan summary is not in accordance with the actual provisions, please alert the actuaries IMMEDIATELY, so they can both be sure the proper provisions are valued.

## Effective Date and Transition

GASB Statement Nos. 74 and 75 are effective for fiscal years beginning after June 15, 2016, and June 15, 2017, respectively.

## SECTION B

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### FINANCIAL STATEMENTS

Auditor's Note – This information is intended to assist in preparation of the financial statements of the Manchester Employees Contributory Retirement System. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

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

### Assets

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

### Liabilities

Payables		
Accounts Payable and Accrued Expenses	\$	137,034
Payable for Investments Purchased		5,093
Benefits Payable		1,540,025
<b>Total Liabilities</b>	<b>\$</b>	<b><u>1,682,152</u></b>

<b>Assets Held for Pensions</b>	<b>\$</b>	<b><u>203,944,654</u></b>
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<b>Net Position Restricted for OPEB</b>	<b>\$</b>	<b><u><u>12,268,459</u></u></b>
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## Statement of Changes in Fiduciary Net Position for Year Ended December 31, 2018

	<b>2018</b>
<b>Additions</b>	
Contributions	
Employer	\$ 856,677
Nonemployer contributing entities	0
Active Employees	674,011
Other	0
<b>Total Contributions</b>	<b>\$ 1,530,688</b>
Investment Income	
Net Appreciation in Fair Value of Investments	\$ (651,458)
Interest and Dividends	0
Less Investment Expense	(37,537)
<b>Net Investment Income</b>	<b>\$ (688,995)</b>
Other	\$ 0
<b>Total Additions</b>	<b>\$ 841,693</b>
 <b>Deductions</b>	
Benefit Payments	\$ 1,065,835
OPEB Plan Administrative Expense	37,111
Other	3,484
<b>Total Deductions</b>	<b>\$ 1,106,430</b>
<b>Net Increase in Net Position</b>	<b>\$ (264,737)</b>
 <b>Net Position Restricted for OPEB</b>	
Beginning of Year	\$ 12,533,196
End of Year	<b>\$ 12,268,459</b>

## SECTION C

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### **REQUIRED SUPPLEMENTARY INFORMATION**

Auditor's Note – This information is intended to assist in preparation of the financial statements of the City of Manchester Employees' Contributory Retirement System. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

# Schedules of Required Supplementary Information

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

(Ultimately 10 Years Will Be Displayed)

Fiscal year ending December 31,	<b>2018</b>
<b>Total OPEB liability</b>	
Service cost	\$ 667,057
Interest on the total OPEB liability	1,834,405
Changes of benefit terms	0
Difference between expected and actual experience	871,321
Changes of assumptions	0
Benefit payments, including refunds of employee contributions	(1,065,835)
<b>Net change in total OPEB liability</b>	<b>2,306,948</b>
<b>Total OPEB liability - beginning</b>	<b>26,405,178</b>
<b>Total OPEB liability - ending (a)</b>	<b>\$ 28,712,126</b>
<b>Plan fiduciary net position</b>	
Employer contributions	\$ 856,677
Nonemployer contributing entities contributions	0
Employee contributions	674,011
OPEB plan net investment income	(688,995)
Benefit payments, including refunds of employee contributions	(1,065,835)
OPEB plan administrative expense	(37,111)
Other	(3,484)
<b>Net change in plan fiduciary net position</b>	<b>(264,737)</b>
<b>Plan fiduciary net position - beginning</b>	<b>12,533,196</b>
<b>Plan fiduciary net position - ending (b)</b>	<b>\$ 12,268,459</b>
<b>Net OPEB liability - ending (a) - (b)</b>	<b>\$ 16,443,667</b>
<b>Plan fiduciary net position as a percentage</b>	
<b>of total OPEB liability</b>	<b>42.73 %</b>
<b>Covered-employee payroll</b>	<b>\$ 51,787,265</b>
<b>Net OPEB liability as a percentage of covered-employee payroll</b>	<b>31.75 %</b>
<b>Notes to Schedule:</b>	
N/A	



# Schedules of Required Supplementary Information

## Schedule of the Net OPEB Liability Multiyear

(Ultimately 10 Years Will Be Displayed)

FY Ending December 31,	Total OPEB Liability	Plan Net Position	Net OPEB Liability	Plan Net Position as a % of Total OPEB Liability	Covered Payroll*	Net OPEB Liability as a % of Covered Payroll
2017	\$ 26,405,178	\$ 12,535,536	\$ 13,869,642	47.47 %	\$ 53,364,536	25.99 %
2018	28,712,126	12,268,459	16,443,667	42.73 %	51,787,265	31.75 %

*\*Based on valuation payroll as of plan year ending December 31.*

## Schedule of Contributions Multiyear Last 10 Fiscal Years

Plan Year Ending December 31,	Actuarially Determined Contribution (ADC) <sup>#</sup>	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll*	Actual Contribution as a % of Covered Payroll
2017	\$ 715,870	\$ 715,870	\$ 0	\$ 53,364,536	1.34 %
2018	856,677	856,677	0	51,787,265	1.65 %

*\*Based on valuation payroll as of plan year ending December 31.*

*<sup>#</sup>Employer contributes based on percent of payroll. Employer pays 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 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 Rates:

Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage 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	None.
Increases	Annual health subsidy amounts are assumed to increase by 4% annually.
Health Care Trend Rates	Not applicable, given that the benefits are fixed stipends.
Aging Factors	Not applicable, given that the benefits are fixed stipends.

### Other Information:

**Notes** None.

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

Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage 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	7.00% (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	None.
Increases	Annual health subsidy amounts are assumed to increase by 4% annually.
Health Care Trend Rates	Not applicable, given that the benefits are fixed stipends.
Aging Factors	Not applicable, given that the benefits are fixed stipends.

### 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

Auditor's Note – This information is intended to assist in preparation of the financial statements of the City of Manchester Employees' Contributory Retirement System. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

## Single Discount Rate

A Single Discount Rate of 7.00 % was used to measure the total OPEB liability. This Single Discount Rate was based on the expected rate of return on OPEB plan investments of 7.00%. The projection of cash flows used to determine this Single Discount Rate assumed that employer contributions will be made at rates equal to the actuarially determined contribution rate. Based on these assumptions, the OPEB 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 OPEB plan investments was applied to all periods of projected benefit payments to determine the total OPEB liability.

## Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	354
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	109
Active Plan Members	<u>1,142</u>
Total Plan Members	1,605

## Sensitivity of Net OPEB Liability

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

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

	1% Decrease 6.00%	Current Single Discount Rate Assumption 7.00%	1% Increase 8.00%
Total OPEB Liability (TOL)	\$ 32,483,511	\$ 28,712,126	\$ 25,556,254
Net Position Restricted for Pensions	12,268,459	12,268,459	12,268,459
Net OPEB Liability	\$ 20,215,052	\$ 16,443,667	\$ 13,287,795

**SECTION E**

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**SUMMARY OF BENEFITS**

## Summary of Health Subsidy Benefits

Current and future retired members who are in receipt of an annuity benefit may elect to participate in a monthly health insurance subsidy. Spouses, dependents, and/or beneficiaries are not eligible for any subsidy. The full amount of the monthly health insurance subsidy is \$200 as of January 1, 2006 and increases by 4% annually beginning January 1, 2007. The full \$200 is prorated based on the member's service at retirement, as shown in the schedule below. Members who were already retired as of March 2006 are entitled to 50% of the subsidy available to members retired after March 2006. Active members must contribute 1.25% of pay. Member contributions for the health subsidy are non-refundable.

Service at Retirement	% of Full Subsidy Payable	
	Active on or after March 1, 2006	Terminated Vested or Retired on March 1, 2006
Less than 10 years	25.0%	12.5%
10 years or more, but less than 15 years	50.0%	25.0%
15 years or more, but less than 20 years	75.0%	37.5%
20 years or more	100.0%	50.0%

As of January 1, 2019, the subsidy amount is \$333 per month.



## **SECTION F**

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### **VALUATION METHODS 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 No. 74 requires 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 MECRS 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.

## Actuarial Assumptions Used for the Valuation

**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:

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.

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	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

## 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>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>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>Subsidy COLA Assumption:</b>	The only increases in subsidy benefits valued are the 4% annual increases called for in the plan provisions.
<b>Utilization:</b>	55% of current actives and 25% of current terminated vested members were assumed to elect to receive the post-retirement health subsidy upon retirement.



## **SECTION G**

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### **CALCULATION OF THE SINGLE DISCOUNT RATE**

## Calculation of the Single Discount Rate

GASB Statement No. 74 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total OPEB 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 OPEB 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 OPEB plan investments is 7.00%, the municipal bond rate is 3.71%, and the resulting Single Discount Rate is 7.00%.

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.

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. Contribution amounts shown are strictly for the purpose of testing for a GASB depletion date and may differ from those determined by a funding valuation.

In a closed group, the members that survive in active status the longest tend to have a lower normal cost than the average normal cost on the valuation date. Since the employee contribution rate is currently just under the average normal cost but above the average normal cost expected in a few years for remaining members, contributions at this rate would eventually overfund the benefits (assuming the employer fully funded the current UAAL). This phenomenon is illustrated in the projections. It is important to note that this phenomenon is not likely to occur for the open group. In addition, if the plan were closed, there would be implications on the expected rate of investment return that are not modeled in the projections and could eliminate this phenomenon.

# Single Discount Rate Development

## Projection of Contributions Ending December 31 for 2018 to 2068

Year	Projected Payroll for Current Employees	Projected Contributions from Current Employees	Projected Service Cost and Expense Contributions	Projected UAL Contributions	Projected Total Contributions
2018	\$ 51,787,265				
2019	54,260,716	\$ 678,259	\$ 105,187	\$ 1,178,935	\$ 1,962,381
2020	51,279,750	640,997	77,782	1,211,356	1,930,134
2021	48,838,511	610,481	61,872	1,244,668	1,917,021
2022	46,545,483	581,819	50,755	1,278,896	1,911,469
2023	44,401,758	555,022	40,793	1,314,066	1,909,881
2024	42,205,983	527,575	32,739	1,350,203	1,910,516
2025	40,145,449	501,818	25,112	1,387,333	1,914,263
2026	38,060,447	475,756	18,628	1,425,485	1,919,868
2027	35,913,433	448,918	12,866	1,464,686	1,926,469
2028	33,841,274	423,016	8,359	1,504,965	1,936,340
2029	31,765,347	397,067	3,902	1,546,351	1,947,320
2030	29,773,761	372,172	118	1,588,876	1,961,166
2031	27,848,628	348,108	0	1,632,570	1,980,678
2032	26,053,215	325,665	0	1,677,466	2,003,131
2033	24,337,873	304,223	0	1,723,596	2,027,819
2034	22,740,739	284,259	0	1,770,995	2,055,254
2035	21,232,488	265,406	0	1,819,697	2,085,103
2036	19,750,684	246,884	0	1,869,739	2,116,622
2037	18,400,264	230,003	0	1,921,157	2,151,160
2038	17,098,784	213,735	0	1,973,989	2,187,723
2039	15,935,596	199,195	0	2,028,273	2,227,468
2040	14,761,061	184,513	0	0	184,513
2041	13,692,132	171,152	0	0	171,152
2042	12,710,092	158,876	0	0	158,876
2043	11,733,938	146,674	0	0	146,674
2044	10,830,598	135,382	0	0	135,382
2045	9,910,445	123,881	0	0	123,881
2046	9,083,459	113,543	0	0	113,543
2047	8,252,395	103,155	0	0	103,155
2048	7,455,824	93,198	0	0	93,198
2049	6,675,474	83,443	0	0	83,443
2050	5,964,675	74,558	0	0	74,558
2051	5,304,304	66,304	0	0	66,304
2052	4,671,789	58,397	0	0	58,397
2053	4,064,721	50,809	0	0	50,809
2054	3,472,342	43,404	0	0	43,404
2055	2,965,232	37,065	0	0	37,065
2056	2,462,334	30,779	0	0	30,779
2057	2,012,934	25,162	0	0	25,162
2058	1,634,936	20,437	0	0	20,437
2059	1,297,979	16,225	0	0	16,225
2060	1,009,279	12,616	0	0	12,616
2061	778,897	9,736	0	0	9,736
2062	603,600	7,545	0	0	7,545
2063	455,141	5,689	0	0	5,689
2064	342,540	4,282	0	0	4,282
2065	242,644	3,033	0	0	3,033
2066	163,223	2,040	0	0	2,040
2067	112,757	1,409	0	0	1,409
2068	75,391	942	0	0	942

# Single Discount Rate Development

## Projection of Contributions Ending December 31 for 2069 to 2118

Year	Projected Payroll for Current Employees	Projected Contributions from Current Employees	Projected Service Cost and Expense Contributions	Projected UAL Contributions	Projected Total Contributions
2069	49,106 \$	614 \$	0 \$	0 \$	614
2070	31,172	390	0	0	390
2071	21,111	264	0	0	264
2072	13,441	168	0	0	168
2073	8,982	112	2	0	114
2074	5,329	67	0	0	67
2075	3,022	38	0	0	38
2076	1,704	21	0	0	21
2077	952	12	0	0	12
2078	366	5	0	0	5
2079	0	0	0	0	0
2080	0	0	0	0	0
2081	0	0	0	0	0
2082	0	0	0	0	0
2083	0	0	0	0	0
2084	0	0	0	0	0
2085	0	0	0	0	0
2086	0	0	0	0	0
2087	0	0	0	0	0
2088	0	0	0	0	0
2089	0	0	0	0	0
2090	0	0	0	0	0
2091	0	0	0	0	0
2092	0	0	0	0	0
2093	0	0	0	0	0
2094	0	0	0	0	0
2095	0	0	0	0	0
2096	0	0	0	0	0
2097	0	0	0	0	0
2098	0	0	0	0	0
2099	0	0	0	0	0
2100	0	0	0	0	0
2101	0	0	0	0	0
2102	0	0	0	0	0
2103	0	0	0	0	0
2104	0	0	0	0	0
2105	0	0	0	0	0
2106	0	0	0	0	0
2107	0	0	0	0	0
2108	0	0	0	0	0
2109	0	0	0	0	0
2110	0	0	0	0	0
2111	0	0	0	0	0
2112	0	0	0	0	0
2113	0	0	0	0	0
2114	0	0	0	0	0
2115	0	0	0	0	0
2116	0	0	0	0	0
2117	0	0	0	0	0
2118	0	0	0	0	0

# Single Discount Rate Development

## Projection of Plan Net Position

### Ending December 31 for 2019 to 2068

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.000%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2019	\$ 12,268,459	\$ 1,962,381	\$ 804,654	\$ 0	\$ 898,627	\$ 14,324,813
2020	14,324,813	1,930,134	939,647	0	1,036,818	16,352,118
2021	16,352,118	1,917,021	1,084,922	0	1,173,279	18,357,496
2022	18,357,496	1,911,469	1,235,695	0	1,308,277	20,341,547
2023	20,341,547	1,909,881	1,397,895	0	1,441,525	22,295,057
2024	22,295,057	1,910,516	1,556,461	0	1,572,836	24,221,949
2025	24,221,949	1,914,263	1,718,792	0	1,702,262	26,119,682
2026	26,119,682	1,919,868	1,889,163	0	1,829,434	27,979,821
2027	27,979,821	1,926,469	2,060,608	0	1,953,972	29,799,655
2028	29,799,655	1,936,340	2,230,128	0	2,075,867	31,581,734
2029	31,581,734	1,947,320	2,402,374	0	2,195,064	33,321,743
2030	33,321,743	1,961,166	2,568,150	0	2,311,637	35,026,396
2031	35,026,396	1,980,678	2,733,346	0	2,425,950	36,699,678
2032	36,699,678	2,003,131	2,888,607	0	2,538,510	38,352,712
2033	38,352,712	2,027,819	3,036,684	0	2,649,977	39,993,824
2034	39,993,824	2,055,254	3,182,016	0	2,760,798	41,627,860
2035	41,627,860	2,085,103	3,315,244	0	2,871,623	43,269,342
2036	43,269,342	2,116,622	3,439,696	0	2,983,330	44,929,598
2037	44,929,598	2,151,160	3,561,814	0	3,096,534	46,615,479
2038	46,615,479	2,187,723	3,677,395	0	3,211,827	48,337,634
2039	48,337,634	2,227,468	3,777,149	0	3,330,313	50,118,266
2040	50,118,266	184,513	3,869,318	0	3,381,492	49,814,953
2041	49,814,953	171,152	3,950,738	0	3,356,999	49,392,365
2042	49,392,365	158,876	4,020,175	0	3,324,606	48,855,672
2043	48,855,672	146,674	4,078,278	0	3,284,618	48,208,686
2044	48,208,686	135,382	4,118,154	0	3,237,569	47,463,484
2045	47,463,484	123,881	4,150,912	0	3,183,882	46,620,334
2046	46,620,334	113,543	4,169,629	0	3,123,861	45,688,110
2047	45,688,110	103,155	4,183,485	0	3,057,772	44,665,551
2048	44,665,551	93,198	4,181,368	0	2,985,923	43,563,303
2049	43,563,303	83,443	4,163,207	0	2,909,055	42,392,594
2050	42,392,594	74,558	4,131,810	0	2,827,880	41,163,222
2051	41,163,222	66,304	4,091,132	0	2,742,939	39,881,333
2052	39,881,333	58,397	4,039,412	0	2,654,714	38,555,032
2053	38,555,032	50,809	3,979,741	0	2,563,665	37,189,765
2054	37,189,765	43,404	3,914,240	0	2,470,096	35,789,025
2055	35,789,025	37,065	3,834,809	0	2,374,559	34,365,841
2056	34,365,841	30,779	3,743,105	0	2,277,875	32,931,390
2057	32,931,390	25,162	3,642,247	0	2,180,740	31,495,045
2058	31,495,045	20,437	3,533,431	0	2,083,778	30,065,828
2059	30,065,828	16,225	3,418,540	0	1,987,541	28,651,054
2060	28,651,054	12,616	3,298,695	0	1,892,506	27,257,481
2061	27,257,481	9,736	3,175,981	0	1,799,079	25,890,316
2062	25,890,316	7,545	3,051,979	0	1,707,569	24,553,451
2063	24,553,451	5,689	2,927,678	0	1,618,202	23,249,664
2064	23,249,664	4,282	2,803,906	0	1,531,147	21,981,186
2065	21,981,186	3,033	2,681,456	0	1,446,524	20,749,288
2066	20,749,288	2,040	2,559,662	0	1,364,447	19,556,113
2067	19,556,113	1,409	2,438,586	0	1,285,069	18,404,006
2068	18,404,006	942	2,318,670	0	1,208,532	17,294,809

# Single Discount Rate Development Projection of Plan Net Position Ending December 31 for 2069 to 2118

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.000%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
2069	17,294,809	614	2,199,855	0	1,134,965	16,230,534
2070	16,230,534	390	2,082,059	0	1,064,511	15,213,376
2071	15,213,376	264	1,965,285	0	997,324	14,245,678
2072	14,245,678	168	1,849,553	0	933,564	13,329,857
2073	13,329,857	114	1,734,816	0	873,402	12,468,557
2074	12,468,557	67	1,621,121	0	817,022	11,664,525
2075	11,664,525	38	1,508,572	0	764,611	10,920,602
2076	10,920,602	21	1,397,362	0	716,362	10,239,623
2077	10,239,623	12	1,287,740	0	672,465	9,624,361
2078	9,624,361	5	1,180,018	0	633,103	9,077,450
2079	9,077,450	0	1,074,564	0	598,448	8,601,334
2080	8,601,334	0	971,813	0	568,655	8,198,177
2081	8,198,177	0	872,260	0	543,860	7,869,776
2082	7,869,776	0	776,415	0	524,169	7,617,530
2083	7,617,530	0	684,804	0	509,664	7,442,390
2084	7,442,390	0	597,963	0	500,393	7,344,819
2085	7,344,819	0	516,450	0	496,367	7,324,736
2086	7,324,736	0	440,813	0	497,564	7,381,487
2087	7,381,487	0	371,521	0	503,921	7,513,887
2088	7,513,887	0	308,923	0	515,343	7,720,307
2089	7,720,307	0	253,217	0	531,709	7,998,799
2090	7,998,799	0	204,411	0	552,883	8,347,270
2091	8,347,270	0	162,342	0	578,723	8,763,651
2092	8,763,651	0	126,715	0	609,096	9,246,032
2093	9,246,032	0	97,106	0	643,881	9,792,807
2094	9,792,807	0	72,986	0	682,985	10,402,807
2095	10,402,807	0	53,746	0	726,347	11,075,408
2096	11,075,408	0	38,741	0	773,946	11,810,613
2097	11,810,613	0	27,310	0	825,803	12,609,106
2098	12,609,106	0	18,814	0	881,990	13,472,282
2099	13,472,282	0	12,658	0	942,624	14,402,248
2100	14,402,248	0	8,312	0	1,007,871	15,401,807
2101	15,401,807	0	5,325	0	1,077,943	16,474,425
2102	16,474,425	0	3,327	0	1,153,095	17,624,193
2103	17,624,193	0	2,028	0	1,233,624	18,855,789
2104	18,855,789	0	1,205	0	1,319,864	20,174,448
2105	20,174,448	0	699	0	1,412,187	21,585,937
2106	21,585,937	0	396	0	1,511,002	23,096,543
2107	23,096,543	0	219	0	1,616,750	24,713,075
2108	24,713,075	0	119	0	1,729,911	26,442,867
2109	26,442,867	0	63	0	1,850,999	28,293,802
2110	28,293,802	0	33	0	1,980,565	30,274,334
2111	30,274,334	0	17	0	2,119,203	32,393,519
2112	32,393,519	0	9	0	2,267,546	34,661,057
2113	34,661,057	0	4	0	2,426,274	37,087,326
2114	37,087,326	0	2	0	2,596,113	39,683,437
2115	39,683,437	0	1	0	2,777,841	42,461,276
2116	42,461,276	0	0	0	2,972,289	45,433,565
2117	45,433,565	0	0	0	3,180,350	48,613,915
2118	48,613,915	0	0	0	3,402,974	52,016,889

# Single Discount Rate Development

## Present Values of Projected Benefits

### Ending December 31 for 2019 to 2068

Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Projected Benefit Payments	Unfunded Portion of Projected 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 All Benefit Payments using Single Discount Rate (SDR)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v <sup>a</sup> ((a)-.5)	(g)=(e)*vf <sup>a</sup> ((a)-.5)	(h)=(c)/(1+SDR) <sup>a</sup> ((a)-.5)
2019	\$ 12,268,459	\$ 804,654	\$ 804,654	\$ 0	\$ 777,888	\$ 0	\$ 777,888
2020	14,324,813	939,647	939,647	0	848,964	0	848,964
2021	16,352,118	1,084,922	1,084,922	0	916,092	0	916,092
2022	18,357,496	1,235,695	1,235,695	0	975,143	0	975,143
2023	20,341,547	1,397,895	1,397,895	0	1,030,974	0	1,030,974
2024	22,295,057	1,556,461	1,556,461	0	1,072,821	0	1,072,821
2025	24,221,949	1,718,792	1,718,792	0	1,107,207	0	1,107,207
2026	26,119,682	1,889,163	1,889,163	0	1,137,342	0	1,137,342
2027	27,979,821	2,060,608	2,060,608	0	1,159,400	0	1,159,400
2028	29,799,655	2,230,128	2,230,128	0	1,172,692	0	1,172,692
2029	31,581,734	2,402,374	2,402,374	0	1,180,622	0	1,180,622
2030	33,321,743	2,568,150	2,568,150	0	1,179,524	0	1,179,524
2031	35,026,396	2,733,346	2,733,346	0	1,173,269	0	1,173,269
2032	36,699,678	2,888,607	2,888,607	0	1,158,797	0	1,158,797
2033	38,352,712	3,036,684	3,036,684	0	1,138,505	0	1,138,505
2034	39,993,824	3,182,016	3,182,016	0	1,114,946	0	1,114,946
2035	41,627,860	3,315,244	3,315,244	0	1,085,633	0	1,085,633
2036	43,269,342	3,439,696	3,439,696	0	1,052,698	0	1,052,698
2037	44,929,598	3,561,814	3,561,814	0	1,018,759	0	1,018,759
2038	46,615,479	3,677,395	3,677,395	0	983,007	0	983,007
2039	48,337,634	3,777,149	3,777,149	0	943,619	0	943,619
2040	50,118,266	3,869,318	3,869,318	0	903,406	0	903,406
2041	49,814,953	3,950,738	3,950,738	0	862,071	0	862,071
2042	49,392,365	4,020,175	4,020,175	0	819,834	0	819,834
2043	48,855,672	4,078,278	4,078,278	0	777,274	0	777,274
2044	48,208,686	4,118,154	4,118,154	0	733,527	0	733,527
2045	47,463,484	4,150,912	4,150,912	0	690,993	0	690,993
2046	46,620,334	4,169,629	4,169,629	0	648,699	0	648,699
2047	45,688,110	4,183,485	4,183,485	0	608,276	0	608,276
2048	44,665,551	4,181,368	4,181,368	0	568,194	0	568,194
2049	43,563,303	4,163,207	4,163,207	0	528,716	0	528,716
2050	42,392,594	4,131,810	4,131,810	0	490,401	0	490,401
2051	41,163,222	4,091,132	4,091,132	0	453,807	0	453,807
2052	39,881,333	4,039,412	4,039,412	0	418,757	0	418,757
2053	38,555,032	3,979,741	3,979,741	0	385,580	0	385,580
2054	37,189,765	3,914,240	3,914,240	0	354,424	0	354,424
2055	35,789,025	3,834,809	3,834,809	0	324,516	0	324,516
2056	34,365,841	3,743,105	3,743,105	0	296,033	0	296,033
2057	32,931,390	3,642,247	3,642,247	0	269,212	0	269,212
2058	31,495,045	3,533,431	3,533,431	0	244,083	0	244,083
2059	30,065,828	3,418,540	3,418,540	0	220,698	0	220,698
2060	28,651,054	3,298,695	3,298,695	0	199,029	0	199,029
2061	27,257,481	3,175,981	3,175,981	0	179,088	0	179,088
2062	25,890,316	3,051,979	3,051,979	0	160,837	0	160,837
2063	24,553,451	2,927,678	2,927,678	0	144,193	0	144,193
2064	23,249,664	2,803,906	2,803,906	0	129,063	0	129,063
2065	21,981,186	2,681,456	2,681,456	0	115,352	0	115,352
2066	20,749,288	2,559,662	2,559,662	0	102,909	0	102,909
2067	19,556,113	2,438,586	2,438,586	0	91,627	0	91,627
2068	18,404,006	2,318,670	2,318,670	0	81,422	0	81,422

# Single Discount Rate Development

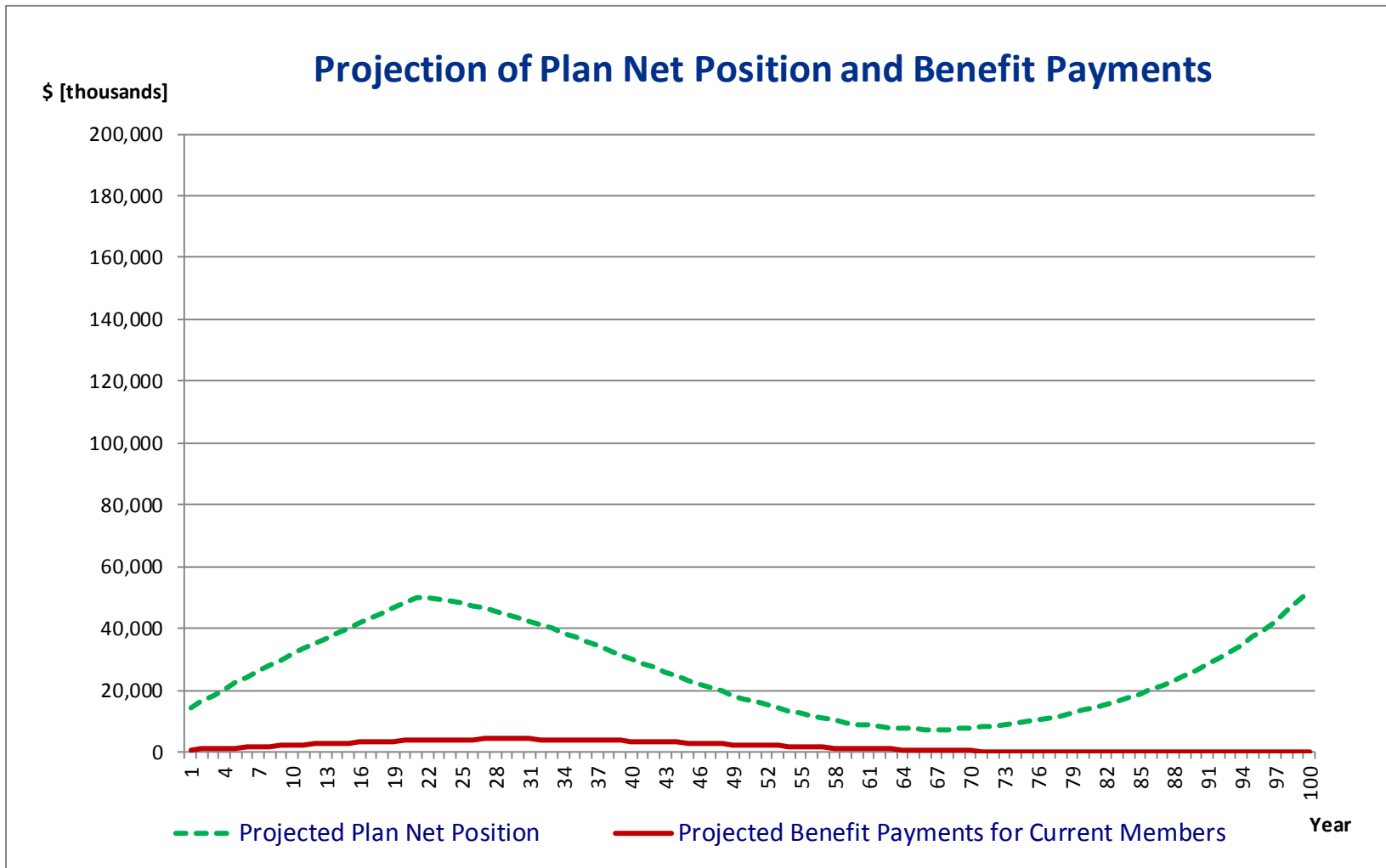
## Present Values of Projected Benefits

### Ending December 31 for 2069 to 2118

Year	Projected Plan Net Position	Projected Benefit Payments	Funded Portion of Projected Benefit Payments	Unfunded Portion of Projected 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 All Benefit Payments using Single Discount Rate (SDR)		
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v <sup>a</sup> ((a)-.5)	(g)=(e)*vf <sup>a</sup> ((a)-.5)	(h)=(c)/(1+SDR) <sup>a</sup> ((a)-.5)		
2069	\$ 17,294,809	\$ 2,199,855	\$ 2,199,855	\$ 0	\$ 72,196	\$ 0	\$ 72,196		
2070	16,230,534	2,082,059	2,082,059	0	63,860	0	63,860		
2071	15,213,376	1,965,285	1,965,285	0	56,335	0	56,335		
2072	14,245,678	1,849,553	1,849,553	0	49,549	0	49,549		
2073	13,329,857	1,734,816	1,734,816	0	43,435	0	43,435		
2074	12,468,557	1,621,121	1,621,121	0	37,933	0	37,933		
2075	11,664,525	1,508,572	1,508,572	0	32,990	0	32,990		
2076	10,920,602	1,397,362	1,397,362	0	28,559	0	28,559		
2077	10,239,623	1,287,740	1,287,740	0	24,597	0	24,597		
2078	9,624,361	1,180,018	1,180,018	0	21,065	0	21,065		
2079	9,077,450	1,074,564	1,074,564	0	17,927	0	17,927		
2080	8,601,334	971,813	971,813	0	15,152	0	15,152		
2081	8,198,177	872,260	872,260	0	12,710	0	12,710		
2082	7,869,776	776,415	776,415	0	10,574	0	10,574		
2083	7,617,530	684,804	684,804	0	8,716	0	8,716		
2084	7,442,390	597,963	597,963	0	7,113	0	7,113		
2085	7,344,819	516,450	516,450	0	5,741	0	5,741		
2086	7,324,736	440,813	440,813	0	4,580	0	4,580		
2087	7,381,487	371,521	371,521	0	3,607	0	3,607		
2088	7,513,887	308,923	308,923	0	2,803	0	2,803		
2089	7,720,307	253,217	253,217	0	2,148	0	2,148		
2090	7,998,799	204,411	204,411	0	1,620	0	1,620		
2091	8,347,270	162,342	162,342	0	1,203	0	1,203		
2092	8,763,651	126,715	126,715	0	877	0	877		
2093	9,246,032	97,106	97,106	0	628	0	628		
2094	9,792,807	72,986	72,986	0	441	0	441		
2095	10,402,807	53,746	53,746	0	304	0	304		
2096	11,075,408	38,741	38,741	0	205	0	205		
2097	11,810,613	27,310	27,310	0	135	0	135		
2098	12,609,106	18,814	18,814	0	87	0	87		
2099	13,472,282	12,658	12,658	0	55	0	55		
2100	14,402,248	8,312	8,312	0	33	0	33		
2101	15,401,807	5,325	5,325	0	20	0	20		
2102	16,474,425	3,327	3,327	0	12	0	12		
2103	17,624,193	2,028	2,028	0	7	0	7		
2104	18,855,789	1,205	1,205	0	4	0	4		
2105	20,174,448	699	699	0	2	0	2		
2106	21,585,937	396	396	0	1	0	1		
2107	23,096,543	219	219	0	1	0	1		
2108	24,713,075	119	119	0	0	0	0		
2109	26,442,867	63	63	0	0	0	0		
2110	28,293,802	33	33	0	0	0	0		
2111	30,274,334	17	17	0	0	0	0		
2112	32,393,519	9	9	0	0	0	0		
2113	34,661,057	4	4	0	0	0	0		
2114	37,087,326	2	2	0	0	0	0		
2115	39,683,437	1	1	0	0	0	0		
2116	42,461,276	0	0	0	0	0	0		
2117	45,433,565	0	0	0	0	0	0		
2118	48,613,915	0	0	0	0	0	0		
<b>Totals</b>	\$			\$	34,557,149	\$	0	\$	34,557,149



## Projection of Plan Net Position and Benefit Payments



# SECTION H

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## GLOSSARY OF TERMS

# Glossary of Terms

<b>Accrued Service</b>	Service credited under the system that was rendered before the date of the actuarial valuation.
<b>Actuarial Accrued Liability (AAL)</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>Actuarial Assumptions</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>Actuarial Cost Method</b>	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the OPEB 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>Actuarial Equivalent</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>Actuarial Gain (Loss)</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>Actuarial Present Value (APV)</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>Actuarial Valuation</b>	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total OPEB liability, and related actuarial present value of projected benefit payments for OPEB.
<b>Actuarial Valuation Date</b>	The date as of which an actuarial valuation is performed.

# Glossary of Terms

<b>Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)</b>	A calculated contribution into an OPEB 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.
<b>Amortization Method</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>Amortization Payment</b>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<b>Cost-of-Living Adjustments</b>	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
<b>Cost-Sharing Multiple-Employer Defined Benefit OPEB Plan (cost-sharing OPEB plan)</b>	A multiple-employer defined benefit OPEB plan in which the OPEB obligations to the employees of more than one employer are pooled and OPEB plan assets can be used to pay the benefits of the employees of any employer that provides benefits through the OPEB plan.
<b>Covered-Employee Payroll</b>	The payroll of employees that are provided with benefits through the OPEB plan.
<b>Deferred Inflows and Outflows</b>	The deferred inflows and outflows of OPEB resources are amounts used under GASB Statement No. 75 in developing the annual OPEB expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in the OPEB expense should be included in the deferred inflows or outflows of resources.
<b>Discount Rate</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 OPEB 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

## **Entry Age Actuarial Cost Method (EAN)**

The EAN is a cost 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 age(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.

## **Fiduciary Net Position**

The fiduciary net position is the market value of the assets of the trust dedicated to the defined benefit provisions.

## **GASB**

The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.

## **Long-Term Expected Rate of Return**

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.

## **Money-Weighted Rate of Return**

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. 74, the money-weighted rate of return is calculated as the internal rate of return on OPEB plan investments, net of OPEB plan investment expense.

## **Multiple-Employer Defined Benefit OPEB Plan**

A multiple-employer plan is a defined benefit OPEB plan that is used to provide OPEB payments to the employees of more than one employer.

## **Municipal Bond Rate**

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.

## **Net OPEB Liability (NOL)**

The NOL is the liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit OPEB plan.

## **Non-Employer Contributing Entities**

Non-employer contributing entities are entities that make contributions to an OPEB plan that is used to provide OPEB payments to the employees of other entities. For purposes of the GASB accounting statements, plan members are not considered non-employer contributing entities.

## Glossary of Terms

<b>Normal Cost</b>	The portion of the actuarial present value allocated to a valuation year is called the normal cost. For purposes of application to the requirements of this Statement, the term normal cost is the equivalent of service cost.
<b>Other Postemployment Benefits (OPEB)</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 post-employment benefits do not include termination benefits.
<b>Real Rate of Return</b>	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
<b>Service Cost</b>	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.
<b>Total OPEB Expense</b>	The total OPEB 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 OPEB 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. OPEB 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>Total OPEB Liability (TOL)</b>	The TOL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
<b>Unfunded Actuarial Accrued Liability (UAAL)</b>	The UAAL is the difference between actuarial accrued liability and valuation assets.
<b>Valuation Assets</b>	The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of GASB Statement Nos. 74 and 75, the valuation assets are equal to the market value of assets.