

Arapahoe County Retirement Plan

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

Measurement Period Ending December 31, 2021

Employer Fiscal Year Ending December 31, 2022





June 3, 2022

Board of Trustees
Arapahoe County Retirement Plan

Dear Board Members:

This report provides information required by the Arapahoe County Retirement Plan (ACRP) in connection with the Governmental Accounting Standards Board (GASB) Statement No. 67 "Financial Reporting for Pension Plans" and No. 68 "Employer Reporting for Pension Plans."

Our actuarial calculations for this report were prepared for the purpose of complying with the requirements of GASB Statement Nos. 67 and 68. These calculations have been made on a basis that is consistent with our understanding of this Statement.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of satisfying the requirements of GASB Statement Nos. 67 and 68. The Net Pension Liability is not an appropriate measure for measuring 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. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement Nos. 67 and 68 may produce significantly different results. This report may be provided to parties other than the Arapahoe County Retirement Plan ("ACRP") only in its entirety and only with the permission of ACRP. GRS is not responsible for unauthorized use of this report.

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

This report was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

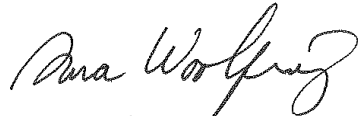
This report complements the actuarial valuation report that was provided to ACRP and should be considered in conjunction with that report. Please see the actuarial valuation report as of January 1, 2022 for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

To the best of our knowledge, the information contained with this report is accurate and fairly represents the actuarial position of the Arapahoe County Retirement Plan. 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.

The signing individuals are independent of the plan sponsor.

Dana Woolfrey and Paul Wood are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,



Dana Woolfrey, FSA, FCA, EA, MAAA



Paul Wood, ASA, FCA, MAAA

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SECTION A

EXECUTIVE SUMMARY

Executive Summary as of December 31, 2022

	2022
Actuarial Valuation Date	January 1, 2022
Measurement Date of the Net Pension Liability	December 31, 2021
Employer's Fiscal Year Ending Date (Reporting Date)	December 31, 2022

Membership

Number of	
- Retirees and Beneficiaries	1,133
- Inactive, Nonretired Members	342
- Active Members	2,098
- Total	3,573
Covered Payroll	\$ 155,331,064

Net Pension Liability

Total Pension Liability	\$ 585,639,282
Plan Fiduciary Net Position	403,954,801
Net Pension Liability	\$ 181,684,481
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	68.98%
Net Pension Liability as a Percentage of Covered Payroll	116.97%

Development of the Single Discount Rate

Single Discount Rate	7.25%
Long-Term Expected Rate of Investment Return	7.25%
Long-Term Municipal Bond Rate*	1.84%
Last year ending December 31 in the 2022 to 2121 projection period for which projected benefit payments are fully funded	2121

Total Pension Expense \$ 14,207,586

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	\$ 10,943,913	\$ -
Changes in assumptions	31,330,110	49,424,521
Net difference between projected and actual earnings on pension plan investments	6,817,638	48,207,630
Total	\$ 49,091,661	\$ 97,632,151

**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 31, 2021. to maturity, mixed quality." In describing this index, the Bond Buyer notes that the bonds' 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 34 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 ACRP subsequent to the measurement date of December 31, 2021.

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 and the net 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;
- 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
- a 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 7.25% 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 decrease as a percentage of payroll as new hires replace members hired prior to July 1, 2010.
2. The unfunded liability is expected to increase in the near term.
3. The unfunded liability is not expected to be fully amortized during the service lifetimes of current members.
4. The funded status of the plan is expected to increase slowly over time.

This funding policy results in a crossover date in 2121 and a GASB single discount rate of 7.25%. 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 January 1, 2022 and a measurement date of December 31, 2021.

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 (which is published by the Federal Reserve) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.25%; the municipal bond rate is 1.84% (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 7.25%. The Single Discount Rate for the prior measurement period was 7.25%.

Effective Date and Transition

GASB Statement Nos. 67 and 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014 respectively, earlier application is encouraged by the GASB.



SECTION B

FINANCIAL STATEMENTS

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

Pension Expense Under GASB Statement No. 68 Fiscal Year Ended December 31, 2022

A. Expense

1. Service Cost	\$	15,698,725
2. Interest on the Total Pension Liability		39,614,882
3. Current-Period Benefit Changes		0
4. Employee Contributions (made negative for addition here)		(13,323,865)
5. Projected Earnings on Plan Investments (made negative for addition here)		(24,940,074)
6. Pension Plan Administrative Expense		480,077
7. Other Changes in Plan Fiduciary Net Position		0
8. Recognition of Outflow (Inflow) of Resources due to Liabilities		7,947,055
9. Recognition of Outflow (Inflow) of Resources due to Assets		(11,269,214)
10. Total Pension Expense	\$	14,207,586

Statement of Outflows and Inflows arising from Current Reporting Period

Fiscal Year Ended December 31, 2022

A. Outflows (Inflows) of Resources due to Liabilities

1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	\$	9,458,193
2. Assumption Changes (gains) or losses	\$	-
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}		5.3214
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	\$	1,777,388
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	\$	1,777,388
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	\$	7,680,805
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	\$	7,680,805

B. Outflows (Inflows) of Resources due to Assets

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	\$	(39,616,283)
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	\$	(7,923,257)
3. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	\$	(31,693,026)



History of Deferred Outflows and Inflows of Resources by Source

Fiscal Year Ended December 31, 2022

Differences between expected and actual experience - Net outflows of resources

Recognition Period	5.4826	5.4404	5.3505	5.3770	5.3955	5.3214	Total	Deferred Net Outflows at Measurement Date
	2017	2018	2019	2020	2021	2022		
Total	\$ (2,292,612)	\$ 578,291	\$ 9,440,968	\$ 1,173,265	\$ 500,023	\$ 9,458,193		
2017	(418,161)						(418,161)	
2018	(418,161)	106,296					(311,865)	
2019	(418,161)	106,296	1,764,502				1,452,637	
2020	(418,161)	106,296	1,764,502	218,201			1,670,838	
2021	(418,161)	106,296	1,764,502	218,201	92,674		1,763,512	
2022	(201,807)	106,296	1,764,502	218,201	92,674	1,777,388	3,757,254	
2023	-	46,811	1,764,502	218,201	92,674	1,777,388	3,899,576	\$ 10,943,913
2024	-	-	618,458	218,201	92,674	1,777,388	2,706,721	
2025	-	-	-	82,260	92,674	1,777,388	1,952,322	
2026	-	-	-	-	36,653	1,777,388	1,814,041	
Thereafter	-	-	-	-	-	571,253	571,253	
	\$ (2,292,612)	\$ 578,291	\$ 9,440,968	\$ 1,173,265	\$ 500,023	\$ 9,458,193	\$ 19,276,289	

Assumption changes - Net outflows of resources

Recognition Period	5.4826	5.4404	5.3505	5.3770	5.3955	5.3214	Total	
	2017	2018	2019	2020	2021	2022		
Total	\$ -	\$ 22,230,845	\$ 108,378,573	\$ (111,802,963)	\$ 3,456,246	\$ -		
2017	-						-	
2018	-	4,086,252					4,086,252	
2019	-	4,086,252	20,255,784				24,342,036	
2020	-	4,086,252	20,255,784	(20,792,814)			3,549,222	
2021	-	4,086,252	20,255,784	(20,792,814)	640,579		4,189,801	
2022	-	4,086,252	20,255,784	(20,792,814)	640,579	-	4,189,801	
2023	-	1,799,585	20,255,784	(20,792,814)	640,579	-	1,903,134	\$ (18,094,411)
2024	-	-	7,099,653	(20,792,814)	640,579	-	(13,052,582)	
2025	-	-	-	(7,838,893)	640,579	-	(7,198,314)	
2026	-	-	-	-	253,351	-	253,351	
Thereafter	-	-	-	-	-	-	-	
	\$ -	\$ 22,230,845	\$ 108,378,573	\$ (111,802,963)	\$ 3,456,246	\$ -	\$ 22,262,701	

Net Difference between projected and actual earnings on pension plan investments - Net outflows of resources

Recognition Period	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	Total	
	2017	2018	2019	2020	2021	2022		
Total	\$ (861,159)	\$ (14,683,003)	\$ 34,088,190	\$ (25,831,921)	\$ (10,303,059)	\$ (39,616,283)		
2017	(172,232)						(172,232)	
2018	(172,232)	(2,936,601)					(3,108,833)	
2019	(172,232)	(2,936,601)	6,817,638				3,708,805	
2020	(172,232)	(2,936,601)	6,817,638	(5,166,384)			(1,457,579)	
2021	(172,231)	(2,936,601)	6,817,638	(5,166,384)	(2,060,612)		(3,518,190)	
2022	-	(2,936,599)	6,817,638	(5,166,384)	(2,060,612)	(7,923,257)	(11,269,214)	
2023	-	-	6,817,638	(5,166,384)	(2,060,612)	(7,923,257)	(8,332,615)	\$ (41,389,992)
2024	-	-	-	(5,166,385)	(2,060,612)	(7,923,257)	(15,150,254)	
2025	-	-	-	-	(2,060,611)	(7,923,257)	(9,983,868)	
2026	-	-	-	-	-	(7,923,255)	(7,923,255)	
Thereafter	-	-	-	-	-	-	-	
	\$ (861,159)	\$ (14,683,003)	\$ 34,088,190	\$ (25,831,921)	\$ (10,303,059)	\$ (39,616,283)	\$ (57,035,003)	

Total - Net outflows of resources

	2017	2018	2019	2020	2021	2022	Total	
Total	\$ (3,153,771)	\$ 8,126,133	\$ 151,907,731	\$ (136,461,619)	\$ (6,346,790)	\$ (30,158,090)		
2017	(590,393)						(590,393)	
2018	(590,393)	1,255,947					665,554	
2019	(590,393)	1,255,947	28,837,924				29,503,478	
2020	(590,393)	1,255,947	28,837,924	(25,740,997)			3,762,481	
2021	(590,392)	1,255,947	28,837,924	(25,740,997)	(1,327,359)		2,435,123	
2022	(201,807)	1,255,949	28,837,924	(25,740,997)	(1,327,359)	(6,145,869)	(3,322,159)	
2023	-	1,846,396	28,837,924	(25,740,997)	(1,327,359)	(6,145,869)	(2,529,905)	\$ (48,540,490)
2024	-	-	7,718,111	(25,740,998)	(1,327,359)	(6,145,869)	(25,496,115)	
2025	-	-	-	(7,756,633)	(1,327,358)	(6,145,869)	(15,229,860)	
2026	-	-	-	-	290,004	(6,145,867)	(5,855,863)	
Thereafter	-	-	-	0	-	571,253	571,253	
	\$ (3,153,771)	\$ 8,126,133	\$ 151,907,731	\$ (136,461,619)	\$ (6,346,790)	\$ (30,158,090)	\$ (15,496,013)	



Statement of Outflows and Inflows arising from Current and Prior Reporting Periods

Fiscal Year Ended December 31, 2022

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	\$ 28,941,676	\$ 20,994,621	\$ 7,947,055
2. Due to Assets	6,817,638	18,086,852	(11,269,214)
3. Total	\$ 35,759,314	\$ 39,081,473	\$ (3,322,159)

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	\$ 3,959,061	\$ 201,807	\$ 3,757,254
2. Assumption Changes	24,982,615	20,792,814	4,189,801
3. Net Difference between projected and actual earnings on pension plan investments	6,817,638	18,086,852	(11,269,214)
4. Total	\$ 35,759,314	\$ 39,081,473	\$ (3,322,159)

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	\$ 10,943,913	\$ 0	\$ 10,943,913
2. Assumption Changes	31,330,110	49,424,521	(18,094,411)
3. Net Difference between projected and actual earnings on pension plan investments	6,817,638	48,207,630	(41,389,992)
4. Total	\$ 49,091,661	\$ 97,632,151	\$ (48,540,490)

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
2023	\$ (2,529,905)
2024	(25,496,115)
2025	(15,229,860)
2026	(5,855,863)
2027	571,253
Thereafter	0
Total	\$ (48,540,490)

Statement of Fiduciary Net Position as of December 31, 2021

	2021
Assets	
Cash and Deposits	\$ 7,843,148
Receivables	
Accounts Receivable - Sale of Investments	\$ -
Accrued Interest and Other Dividends	-
Contributions	-
Accounts Receivable - Other	-
Total Receivables	\$ -
Investments	
Fixed Income	\$ 37,319,830
Domestic Equities	117,807,122
International Equities	88,506,564
Private Equity	29,877,011
Real Estate	67,108,615
Other	55,650,006
Total Investments	\$ 396,269,148
Total Assets	\$ 404,112,296
Liabilities	
Payables	
Accounts Payable - Purchase of Investments	\$ -
Accrued Expenses	-
Accounts Payable - Other	157,495
Total Liabilities	\$ 157,495
Net Position Restricted for Pensions	\$ 403,954,801

Statement of Changes in Fiduciary Net Position for Year Ended December 31, 2021

	2021
Additions	
Contributions	
Employer	\$ 13,341,693
Employee	13,323,865
Other	-
Total Contributions	\$ 26,665,558
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 61,527,291
Interest and Dividends	4,852,242
Less Investment Expense	(1,823,176)
Net Investment Income	\$ 64,556,357
Other	\$ -
Total Additions	\$ 91,221,915
 Deductions	
Benefit Payments, including Refunds of Employee Contributions	\$ 35,390,631
Pension Plan Administrative Expense	480,077
Other	-
Total Deductions	\$ 35,870,708
Net Increase in Net Position	\$ 55,351,207
 Net Position Restricted for Pensions	
Beginning of Year	\$ 348,603,594
End of Year	\$ 403,954,801

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

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

Schedule of Changes in Net Pension Liability and Related Ratios

Current Period

Fiscal Year Ended December 31, 2022

A. Total pension liability	
1. Service Cost	\$ 15,698,725
2. Interest on the Total Pension Liability	39,614,882
3. Changes of benefit terms	0
4. Difference between expected and actual experience of the Total Pension Liability	9,458,193
5. Changes of assumptions	0
6. Benefit payments, including refunds of employee contributions	(35,390,631)
7. Net change in total pension liability	\$ 29,381,169
8. Total pension liability – beginning	556,258,113
9. Total pension liability – ending	<u><u>\$ 585,639,282</u></u>
B. Plan fiduciary net position	
1. Contributions – employer	\$ 13,341,693
2. Contributions – employee	13,323,865
3. Net investment income	64,556,357
4. Benefit payments, including refunds of employee contributions	(35,390,631)
5. Pension Plan Administrative Expense	(480,077)
6. Other	-
7. Net change in plan fiduciary net position	\$ 55,351,207
8. Plan fiduciary net position – beginning	348,603,594
9. Plan fiduciary net position – ending	<u><u>\$ 403,954,801</u></u>
C. Net pension liability	<u><u>\$ 181,684,481</u></u>
D. Plan fiduciary net position as a percentage of the total pension liability	68.98%
E. Covered-employee payroll	\$ 155,331,064
F. Net pension liability as a percentage of covered employee payroll	116.97%



Schedules of Required Supplementary Information

Schedule of Changes in Net Pension Liability and Related Ratios Multiyear

Last 10 Fiscal Years (which may be built prospectively)

Measurement period ending December 31,	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
Total Pension Liability										
Service Cost	\$ 15,698,725	\$ 15,402,103	\$ 19,176,282	\$ 13,374,426	\$ 11,895,316	\$ 11,551,817	\$ 10,966,993	\$ 10,186,256		
Interest on the Total Pension Liability	39,614,882	38,107,210	34,299,145	34,381,543	32,588,637	31,505,045	29,854,357	27,803,874		
Benefit Changes	-	-	-	-	-	-	-	-		
Difference between Expected and Actual Experience	9,458,193	500,023	1,173,265	9,440,968	578,291	(2,292,612)	6,279,309	3,758,718		
Assumption Changes	-	3,456,246	(111,802,963)	108,378,573	22,230,845	-	-	8,605,204		
Benefit Payments	(29,561,506)	(28,439,622)	(26,890,753)	(25,146,993)	(23,557,953)	(22,267,799)	(21,311,701)	(19,218,734)		
Refunds	(5,829,125)	(2,894,103)	(4,341,376)	(4,060,659)	(3,873,640)	(3,276,820)	(3,911,473)	(2,367,372)		
Net Change in Total Pension Liability	29,381,169	26,131,857	(88,386,400)	136,367,858	39,861,496	15,219,631	21,877,485	28,767,946		
Total Pension Liability - Beginning	556,258,113	530,126,256	618,512,656	482,144,798	442,283,302	427,063,671	405,186,186	376,418,240		
Total Pension Liability - Ending (a)	\$ 585,639,282	\$ 556,258,113	\$ 530,126,256	\$ 618,512,656	\$ 482,144,798	\$ 442,283,302	\$ 427,063,671	\$ 405,186,186		
Plan Fiduciary Net Position										
Employer Contributions	\$ 13,341,693	\$ 12,642,439	\$ 11,669,706	\$ 10,442,318	\$ 9,660,642	\$ 9,298,210	\$ 8,749,813	\$ 8,451,497		
Employee Contributions	13,323,865	12,628,547	11,645,850	10,436,036	9,670,411	9,288,083	8,738,077	8,444,077		
Pension Plan Net Investment Income	64,556,357	33,392,944	46,120,308	(12,287,634)	35,237,379	20,473,577	(2,242,209)	18,236,018		
Benefit Payments	(29,561,506)	(28,439,622)	(26,890,753)	(25,146,993)	(23,557,953)	(22,267,799)	(21,311,701)	(19,218,734)		
Refunds	(5,829,125)	(2,894,103)	(4,341,376)	(4,060,659)	(3,873,640)	(3,276,820)	(3,911,473)	(2,367,372)		
Pension Plan Administrative Expense	(480,077)	(478,314)	(500,288)	(393,580)	(373,368)	(396,050)	(334,662)	(493,482)		
Other	-	-	-	-	-	-	-	-		
Net Change in Plan Fiduciary Net Position	55,351,207	26,851,891	37,703,447	(21,010,512)	26,763,471	13,119,201	(10,312,155)	13,052,004		
Plan Fiduciary Net Position - Beginning	348,603,594	321,751,703	284,048,256	305,058,768	278,295,297	265,176,096	275,488,251	262,436,247		
Plan Fiduciary Net Position - Ending (b)	\$ 403,954,801	\$ 348,603,594	\$ 321,751,703	\$ 284,048,256	\$ 305,058,768	\$ 278,295,297	\$ 265,176,096	\$ 275,488,251		
Net Pension Liability - Ending (a) - (b)	181,684,481	207,654,519	208,374,553	334,464,400	177,086,030	163,988,005	161,887,575	129,697,935		
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	68.98 %	62.67 %	60.69 %	45.92 %	63.27 %	62.92 %	62.09 %	67.99 %		
Covered Employee Payroll	\$ 155,331,064	\$ 148,620,818	\$ 142,225,883	\$ 136,875,674	\$ 125,346,071	\$ 120,887,355	\$ 115,287,599	\$ 107,204,231		
Net Pension Liability as a Percentage of Covered Employee Payroll	116.97 %	139.72 %	146.51 %	244.36 %	141.28 %	135.65 %	140.42 %	120.98 %		
Notes to Schedule:										
N/A										



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

Last 10 Fiscal Years (which may be built prospectively)

FY Ending 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	\$ 405,186,186	\$ 275,488,251	\$ 129,697,935	67.99%	\$ 107,204,231	120.98%
2015	\$ 427,063,671	\$ 265,176,096	\$ 161,887,575	62.09%	\$ 115,287,599	140.42%
2016	\$ 442,283,302	\$ 278,295,297	\$ 163,988,005	62.92%	\$ 120,887,355	135.65%
2017	\$ 482,144,798	\$ 305,058,768	\$ 177,086,030	63.27%	\$ 125,346,071	141.28%
2018	\$ 618,512,656	\$ 284,048,256	\$ 334,464,400	45.92%	\$ 136,875,674	244.36%
2019	\$ 530,126,256	\$ 321,751,703	\$ 208,374,553	60.69%	\$ 142,225,883	146.51%
2020	\$ 556,258,113	\$ 348,603,594	\$ 207,654,519	62.67%	\$ 148,620,818	139.72%
2021	\$ 585,639,282	\$ 403,954,801	\$ 181,684,481	68.98%	\$ 155,331,064	116.97%

Schedule of Contributions Multiyear Last 10 Fiscal Years

FY Ending December 31,	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll*	Actual Contribution as a % of Covered Payroll
2014	\$ 10,875,990	\$ 8,451,497	\$ 2,424,493	\$ 100,854,023	8.38%
2015	\$ 12,267,139	\$ 8,749,813	\$ 3,517,326	\$ 107,204,231	8.16%
2016	\$ 13,283,879	\$ 9,298,210	\$ 3,985,669	\$ 115,287,599	8.07%
2017	\$ 13,238,956	\$ 9,660,642	\$ 3,578,314	\$ 120,887,355	7.99%
2018	\$ 16,096,665	\$ 10,442,318	\$ 5,654,347	\$ 125,346,071	8.33%
2019	\$ 17,545,850	\$ 11,669,706	\$ 5,876,144	\$ 136,875,674	8.53%
2020	\$ 18,027,937	\$ 12,642,439	\$ 5,385,498	\$ 142,225,883	8.89%
2021	\$ 18,483,326	\$ 13,341,693	\$ 5,141,633	\$ 148,620,818	8.98%

**Covered payroll is the amount in force as of the valuation date at the beginning of the fiscal year and likely differs from the actual covered payroll during the fiscal year.*

Notes to Schedule of Contributions

Valuation Date:

Notes Actuarially determined contribution rate for fiscal year 2021 is calculated using the actuarial valuation as of January 1, 2021. This rate is calculated annually.

Methods and Assumptions Used to Determine Contribution Rates:

Actuarial Cost Method	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Open
Remaining Amortization Period	20 years
Asset Valuation Method	5-Year smoothed market
Inflation	2.50%
Salary Increases	Age-based: 3.25% to 6.75%.
Investment Rate of Return	7.25%
Retirement Age	Age-based with consideration for eligibility for Special Early Retirement.
Mortality	<p>Healthy: Blended Pub-2010 Amount-Weighted Healthy Retiree Mortality Tables projected with the Ultimate MP-2014 Scale. The Mortality table is blended as follows; 21% Public Safety Mortality Table, 49% General Healthy Retiree Above-Median Income Mortality Table, and 30% General Healthy Retiree Below-Median Income Mortality Table. A 105% multiplier is applied to the female mortality table.</p> <p>Disabled: Blended Pub-2010 Amount-Weighted Disabled Retiree Mortality Tables projected with the Ultimate MP-2014 Scale. The Mortality table is blended as follows; 21% Public Safety Mortality Table, 49% General Disabled Retiree Above-Median Income Mortality Table, and 30% General Disabled Retiree Below-Median Income Mortality Table.</p>
Payroll Growth	3.25%

Other Information:

Notes Assumptions shown are for January 1, 2021 (used to determine 2021 ADC). The Board adopted new assumptions effective with the January 1, 2021 valuation based on the recommendations from the experience study for the 6-year period ending December 31, 2019.

Schedule of Investment Returns Multiyear Last 10 Fiscal Years

<u>FY Ending December 31,</u>	<u>Annual Return¹</u>
2014	6.91 %
2015	(0.93)%
2016	8.06 %
2017	12.56 %
2018	(4.06)%
2019	16.76 %
2020	10.38 %
2021	17.40 %

SECTION D

NOTES TO FINANCIAL STATEMENTS

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

Long-Term Expected Return on Plan Assets

The long-term expected rate of return on pension plan investments was determined using a building-block method in which expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These real rates of return are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. For each major asset class that is included in the pension plan’s target asset allocation as of January 1, 2022, these best estimates are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Public Developed Markets Equity	46.50%	5.11%
Public Emerging Markets Equity	3.50%	6.93%
Private Equity	10.00%	8.90%
Fixed Rate Debt - Investment Grade	10.00%	-0.45%
Private Credit	10.00%	5.55%
Floating Rate Debt - Public	5.00%	1.46%
Private Equity Real Estate	15.00%	4.18%
Total	100.00%	

The figures in the above table were supplied by Captrust. Gabriel, Roeder, Smith & Company does not provide investment advice.

Single Discount Rate

A Single Discount Rate of 7.25% was used to measure the total pension liability. This Single Discount Rate was based on the expected rate of return on pension plan investments of 7.25% and a municipal bond rate of 1.84%. 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 and future contributions were sufficient to finance the benefit payments through the year 2121. As a result, the long-term expected rate of return on pension plan investments was applied to projected benefit payments through the year 2121, and the municipal bond rate was applied to all benefit payments after that date.

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 7.25%, 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	Current Single Discount Rate Assumption	1% Increase
6.25%	7.25%	8.25%
\$249,760,477	\$181,684,481	\$125,389,336

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	1,133
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	342
Active Plan Members	<u>2,098</u>
Total Plan Members	3,573

SECTION E

SUMMARY OF BENEFITS

SUMMARY OF BENEFIT PROVISIONS

BASED ON THE PLAN ORIGINALLY EFFECTIVE JULY 1, 1968 AND AMENDED AND RESTATED EFFECTIVE
JANUARY 1, 2021.

Participation

Any County Official and any person assigned to a full-time position as defined by Arapahoe County Personnel Policies and Procedures including job-sharing employees shall become a member of the Plan on the first day of the pay period coincident with or following date of employment.

Member Contributions

Effective December 21, 2011, each member contributes 7.5% of compensation on a monthly basis. Interest on contributions is credited at a rate of 4.0% per annum compounded annually after December 31, 2003 and prior to July 1, 2010. After June 30, 2010, interest on contributions is credited at a rate of 3.0% per annum, compounded annually. Effective January 1, 2014, each member contributes 8.0% of compensation on a monthly basis. Effective January 1, 2018 each member contributes 8.25% of compensation on a monthly basis. Effective January 1, 2019 each member contributes 8.50% of compensation on a monthly basis. Effective January 1, 2020 each member contributes 8.75% of compensation on a monthly basis. Effective January 1, 2021 each member contributes 9.00% of compensation on a monthly basis.

After December 31, 1983 member contributions are picked up and paid by the County as provided in Code Section 414(h).

County Contributions

The County will match member contributions.

Credited Service

All service completed during the elapsed time from the member's date of employment, excluding any breaks in service, to the member's date of termination on the basis of 1/365th year for each day of employment after July 1, 1968. Service prior to July 1, 1968 will be included (up to five years) provided the employee became a Member on the first date he was first eligible. Service is credited while a member is on long-term disability as long as no benefits are being paid from the plan. Service is adjusted for job-sharing members.

Service Purchase ("air time")

Eligible members may purchase additional years of service credit for any full-time, non-vested previous employment with any public or private employer in the United States, subject to certain restrictions.



Compensation

Compensation is the total regular compensation paid to the member, reflecting the normal regular salary or hourly wage rate, before any payroll deductions for income tax, Social Security, group insurance, or any other purpose, excluding bonuses, extra pay, overtime pay, workers' compensation, single-sum payments received in lieu of accrued vacation and sick leave upon termination of employment or during the course of employment or during the course of employment, required contributions by the County under this Plan, or for Social Security, group insurance, retainers' fees under contract, or the like, but including compensation deferred under Sections 125, 403(b), 414(h), or 457 of the Internal Revenue Code.

Two Part Formula for Benefits Accrued Before and After January 1, 2014

Several changes were made to benefits effective January 1, 2014. For purposes of determining benefit accruals, the "Part A Benefit" shall mean the benefit attributable to service credit earned prior to January 1, 2014. The "Part B Benefit" shall mean the benefit attributable to service credit earned on or after January 1, 2014.

Final Average Monthly Compensation

- *Members hired prior to July 1, 2010:*

Part A Benefit: Average of the highest 36 consecutive calendar months of compensation during the last 120 months of employment.

Part B Benefit: Average of the highest 60 consecutive calendar months of compensation during the last 120 months of employment.

- *Members hired on or after July 1, 2010:*

Average of the highest 60 consecutive calendar months of compensation during the last 120 months of employment.

Accrued Benefit (Part A and Part B)

Part A Benefit:

- *Members hired prior to April 1, 2006:*

2.5% of Final Average Monthly Compensation multiplied by Credited Service or \$25 per year of Credited Service, if greater.

- *Members hired on or after April 1, 2006 and prior to July 1, 2010:*

2.3% of Final Average Monthly Compensation multiplied by Credited Service or \$25 per year of Credited Service, if greater.



- *Members hired on or after July 1, 2010:*

2.0% of Final Average Monthly Compensation multiplied by Credited Service or \$25 per year of Credited Service, if greater.

Part B Benefit:

- *All Members:*

1.85% of Final Average Monthly Compensation multiplied by Credited Service or \$25 per year of Credited Service, if greater.

Vested Accrued Benefit

- *Members hired prior to July 1, 2010 are subject to the following vesting schedule:*

Completed Years of Service	Percent Vested in Accrued Benefit
Less Than 4	0%
4	60%
5	70%
6	80%
7	90%
8 or more	100%

- *Members hired on or after July 1, 2010:*

100% vesting with eight years of service. No partial vesting prior to meeting eight year requirement.

Normal Retirement

Eligibility:

Attainment of age 65.

Benefit:

Accrued Benefit.

Regular Early Retirement

Eligibility:

- *Members hired prior to April 1, 2006:*

Attainment of age 52 and 4 years of Credited Service.



- *Members hired on or after April 1, 2006 and prior to July 1, 2010:*

Attainment of age 55 and 4 years of Credited Service.

- *Members hired on or after July 1, 2010:*

Attainment of age 55 and 8 years of Credited Service.

Benefit:

- *Members hired prior to July 1, 2010:*

Vested Accrued Benefit determined as of his Early Retirement Date, reduced by 0.00555 for each of the first 60 months and 0.00278 for each additional month payments commence prior to the Normal Retirement Date.

- *Members hired on or after July 1, 2010:*

Vested Accrued Benefit determined as of his Early Retirement Date, reduced by 0.00555 for each of the first 60 months and 0.00375 for each additional month payments commence prior to the Normal Retirement Date.

Special Early Retirement

Eligibility:

- *Members hired prior to April 1, 2006:*

- *Members hired prior to April 1, 2006:*

Attainment of age 52 and age plus credited service equals 75 or more at termination.

- *Members hired on or after April 1, 2006 and prior to July 1, 2010:*

Attainment of age 55 and age plus credited service equals 80 or more at termination.

- *Members hired on or after July 1, 2010:*

Attainment of age 60 and age plus credited service equals 85 or more at termination.

Benefit:

Vested Accrued Benefit determined as of his Special Early Retirement Date, unreduced for early payment.



Disability Retirement

Eligibility:

Total and permanent disability. Member qualifies for disability under the County's long-term disability plan or under Title II of the Social Security Act.

Benefit:

Normal Retirement Benefit considering annual rate of compensation at disability and Credited Service he would have accumulated if employment had continued uninterrupted to the later of his Normal Retirement Date or the date that the County's long-term disability benefits end. Benefits commence at Normal Retirement Date.

Vested Termination Benefit

Eligibility:

- *Members hired prior to July 1, 2010:*

Members who have completed at least four years of Credited Service are eligible to receive their Vested Accrued Benefit payable at Normal Retirement Date.

- *Members hired on or after July 1, 2010:*

Members who have completed at least eight years of Credited Service are eligible to receive their Vested Accrued Benefit payable at Normal Retirement Date.

Refund of Accumulated Contributions

Upon termination prior to Normal Retirement Age, in lieu of a monthly pension benefit, the member may elect to receive a refund of a percentage of their accumulated contributions according to the following schedules:

- *Members hired prior to July 1, 2010 for Contributions Made Prior to January 1, 2014:*

Completed Years of Service	Percent of Accumulated Contributions Refunded
Less Than 5	100%
5 to 9	125%
10 to 14	150%
15 or more	200%

- *Members hired on or after July 1, 2010 and Contributions Made by All Members on or After January 1, 2014:*



100% of Accumulated Contributions

- Notwithstanding the above, County Officials who terminate prior to Normal Retirement Age are entitled to receive 200% of their accumulated contributions.

Pre-Retirement Death Benefit

- *Member is single:*

Beneficiary receives two times member's accumulated contributions at date of death.

- *Member is married:*

Spouse receives two times member's accumulated contributions at date of death; or

A monthly benefit equal to 65% of the member's vested accrued benefit, reduced by 1.5% for each year over 5 by which the spouse is younger.

Normal Form

- *Members hired prior to July 1, 2010:*

Monthly benefit paid for the life of the member, and if the member dies prior to receiving 120 monthly payments, the remainder of the 120 payments will be paid to the member's beneficiary.

- *Members hired on or after July 1, 2010:*

Monthly benefit paid for the life of the member.

Optional Forms

- Life annuity
- 10 year certain and life
- 100% joint and survivor annuity
- 50% joint and survivor annuity
- Partial lump sum limited to the lesser of \$100,000 and 36 times the monthly retirement benefit in conjunction with one of the optional forms above

Optional Form Conversion Factors

Optional annuity forms are actuarially equivalent based on 8.00% interest and the 1994 Group Annuity Mortality table blended 50% male and 50% female.



Partial lump sum actuarial equivalence is determined based on the PBGC lump sum interest rate for use in January 1st valuations of the current year and the 1994 Group Annuity Mortality table blended 50% male and 50% female.

Payment Date

Benefits are paid on the first of the month following eligibility for receipt.



SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

I. Valuation Date

The valuation date is January 1st of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

II. Actuarial Cost Method

The actuarial valuation uses the Entry Age Normal actuarial cost method. Under this method, the employer contribution rate is the sum of (i) the employer normal cost rate, and (ii) a rate that will amortize the unfunded actuarial liability.

1. The valuation is prepared on the projected benefit basis. The present value of each participant's expected benefit payable at retirement or termination is determined, based on age, service, sex, compensation, and the interest rate assumed to be earned in the future (7.25%). The calculations take into account the probability of a participant's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his terminating with a service benefit. Future salary increases are also anticipated. The present value of the expected benefits payable on account of the active participants is added to the present value of the expected future payments to retired participants and beneficiaries to obtain the present value of all expected benefits payable from the Plan on account of the present group of participants and beneficiaries.
2. The employer contributions needed to support the benefits of the Plan on an actuarial basis are determined following a level funding approach, and consist of a normal cost contribution and an accrued liability contribution.
3. The normal contribution is determined using the Entry Age Normal method. Under this method, a calculation is made to determine the average uniform and constant percentage rate of employer contribution which, if applied to the compensation of each new participant during the entire period of his anticipated covered service, would be required in addition to the contributions of the participant to meet the cost of all benefits payable on their behalf.
4. The unfunded accrued liability contributions are determined by subtracting the actuarial value of assets from the actuarial accrued liability and amortizing the result over 20 years from the valuation date as a level percentage of pay. It is assumed that payments are made throughout the year.

III. Actuarial Value of Assets

The actuarial value of assets is based on recognizing gains and losses over a five-year period where gains and losses are determined by comparing the projected actuarial value of assets (based on the prior year's actuarial value of assets before application of the corridor, cash flows during the year and expected investment returns on those amounts) to the market value of assets. The actuarial value of assets must be between 80 and 120% of market value.

IV. Actuarial Assumptions

A. Economic Assumptions

1. Investment return: 7.25% per annum, compounded annually, composed of an assumed 2.50% inflation rate and a 4.75% real rate of return. This rate represents the assumed return, net of all investment expenses.
2. Salary increase rate: Inflation rate of 2.50%, plus productivity component of 0.75%, plus step-rate/ promotional component as shown.

Sample Attained Age	Percentage Increase in Salary		
	Merit	Inflation	Total
25	4.25 %	2.50 %	6.75 %
30	3.75	2.50	6.25
35	3.00	2.50	5.50
40	2.25	2.50	4.75
45	2.00	2.50	4.50
50	1.60	2.50	4.10
55	1.30	2.50	3.80
60	1.00	2.50	3.50
65	0.75	2.50	3.25

3. Payroll growth rate: In the amortization of the unfunded actuarial accrued liability, payroll is assumed to increase 3.25% per year. This increase rate is primarily due to the effect of inflation on salaries, with no allowance for future membership growth.

B. Demographic Assumptions

1. Mortality rates (pre- retirement) – Blended Pub-2010 Amount-Weighted Employee Mortality Tables projected with the Ultimate MP-2014 Scale. The Mortality table is blended as follows; 21% Public Safety Mortality Table, 49% General Employee Above-Median Income Mortality Table, and 30% General Employee Below-Median Income Mortality Table.

2. Mortality rates (post- retirement) – Blended Pub-2010 Amount-Weighted Healthy Retiree Mortality Tables projected with the Ultimate MP-2014 Scale. The Mortality table is blended as follows; 21% Public Safety Mortality Table, 49% General Healthy Retiree Above-Median Income Mortality Table, and 30% General Healthy Retiree Below-Median Income Mortality Table. A 105% multiplier is applied to the female mortality table.

3. Mortality rates (post-disablement) – Blended Pub-2010 Amount-Weighted Disabled Retiree Mortality Tables projected with the Ultimate MP-2014 Scale. The Mortality table is blended as follows; 21% Public Safety Mortality Table, 49% General Disabled Retiree Above-Median Income Mortality Table, and 30% General Disabled Retiree Below-Median Income Mortality Table.

Sample rates for the year 2022 are shown below.

Sample Attained Ages	Probability of Death Pre-Retirement		Sample Attained Ages	Probability of Death Post-Retirement		Sample Attained Ages	Probability of Death Post-Disability	
	Men	Women		Men	Women		Men	Women
20	0.03 %	0.01 %	20	0.03 %	0.01 %	20	0.31 %	0.17 %
25	0.03	0.01	25	0.03	0.01	25	0.22	0.13
30	0.03	0.02	30	0.03	0.02	30	0.27	0.20
35	0.04	0.02	35	0.04	0.03	35	0.35	0.30
40	0.06	0.04	40	0.06	0.04	40	0.48	0.47
45	0.09	0.05	45	0.11	0.07	45	0.75	0.73
50	0.14	0.08	50	0.34	0.24	50	1.19	1.10
55	0.20	0.11	55	0.46	0.31	55	1.57	1.31
60	0.29	0.17	60	0.62	0.41	60	1.89	1.50
65	0.43	0.26	65	0.87	0.62	65	2.35	1.78
70	0.68	0.44	70	1.45	1.06	70	3.09	2.30
75	1.10	0.76	75	2.51	1.86	75	4.24	3.26
80	1.82	1.31	80	4.43	3.28	80	6.19	4.94
85	6.72	4.90	85	7.84	5.94	85	9.29	7.81
90	13.34	10.36	90	13.34	10.88	90	14.46	11.87

3. Disability rates. Sample rates shown below:

Sample Attained Ages	Probability of Disablement Next Year	
	Men	Women
25	0.04 %	0.04 %
30	0.05	0.05
35	0.06	0.06
40	0.09	0.09
45	0.13	0.13
50	0.21	0.21
55	0.36	0.36
60	0.54	0.54

4. Termination rates (for causes other than death, disability or retirement): Termination rates are based on service. Termination rates are not applied after a member becomes eligible for a retirement benefit. Rates at selected ages are shown:

Sample Attained Age	Probability of Termination Next Year	
	Men	Women
20	21.00 %	21.00 %
25	15.00	17.50
30	10.00	16.50
35	9.00	12.00
40	5.00	9.50
45	5.00	7.00
50	5.00	5.00
55	5.00	5.00

5. Retirement rates.

Attained Age	Before Eligible Special Early Retirement	After Eligible for Special Early Retirement
52-54	0.0 %	25.0 %
55	5.0	25.0
56-59	5.0	10.0
60-61	5.0	10.0
62	12.0	25.0
63-64	12.0	25.0
65	25.0	50.0
66	25.0	50.0
67-69	25.0	50.0
70 & Over	100.0	100.0

C. Other Assumptions

1. Percent married: 85% of employees are assumed to be married.
2. Age difference: Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger than their spouses.
3. Cost of living adjustment: None.
4. Optional forms: Members are assumed to elect the normal form of benefit.
5. Vested terminating members are assumed to elect a refund or a deferred benefit, whichever is more valuable at the time of termination.
6. Current and future deferred vested participants are assumed to retire at age 52 if termination occurred on or after January 1, 2000 and hired before April 1, 2006. Age 55 otherwise. Deferred disabled participants are assumed to commence benefits at age 65.
7. Members are assumed to utilize 6% of the partial lump sum benefits available to them.
8. Administrative expenses: Prior year actual administrative expenses are included as an explicit charge on the Actuarially Determined Contribution.

9. Pay increase timing: End of (fiscal) year.
10. Decrement timing: Decrements of all types are assumed to occur mid-year.
11. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
12. Decrement relativity: Decrement rates are used directly, without adjustment for multiple decrement table effects.
13. Incidence of Contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.

Assumption Changes Since the Prior Valuation:

- Slight modification to termination rates to reflect experience;
- Slight modification of special early retirement rates to reflect experience;
- Update mortality tables to a blend of the PUB-2010 base tables and use the ultimate rates of the MP-2014 through MP-2019 projection scales to model mortality improvement;
- Slight increase to the merit and productivity component of the salary increase assumption;
- Increase lump sum utilization to 6%; and
- Modify the spouse age difference assumption to males 1 year older than their female spouses.

SECTION G

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 municipal bond rate is required, as described in the following paragraph.

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

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.25%; the municipal bond rate is 1.84%; and the resulting Single Discount Rate is 7.25%.

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 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.

Single Discount Rate Development Projection of Contributions ending December 31 for 2022 to 2071

Year	Projected Payroll for Current Employees	Payroll for Future Employees	Projected Contributions from Current Employees	Employer Contributions for Current Employees	Contributions Related to Payroll of Future Employees	Projected Total Contributions
0	\$ 155,331,064					
1	146,839,114	8,491,950	\$ 13,215,520	\$ 13,215,520	\$ 656,735	\$ 27,087,776
2	137,415,570	22,963,754	12,367,401	12,367,401	1,775,929	26,510,732
3	129,033,963	36,557,689	11,613,057	11,613,057	2,814,016	26,040,129
4	120,997,109	49,976,271	10,889,740	10,889,740	3,831,035	25,610,515
5	113,314,677	63,215,338	10,198,321	10,198,321	4,827,968	25,224,610
6	106,357,182	75,910,058	9,572,146	9,572,146	5,783,771	24,928,064
7	100,149,058	88,041,868	9,013,415	9,013,415	6,702,102	24,728,932
8	94,253,464	100,053,667	8,482,812	8,482,812	7,616,732	24,582,356
9	88,783,519	111,838,594	7,990,517	7,990,517	8,518,340	24,499,373
10	83,755,795	123,386,537	7,538,022	7,538,022	9,405,962	24,482,005
11	78,923,489	134,950,968	7,103,114	7,103,114	10,300,553	24,506,781
12	74,231,066	146,594,311	6,680,796	6,680,796	11,207,488	24,569,080
13	69,767,587	158,234,615	6,279,083	6,279,083	12,120,037	24,678,203
14	65,420,558	169,991,716	5,887,850	5,887,850	13,047,341	24,823,041
15	61,299,035	181,764,137	5,516,913	5,516,913	13,981,097	25,014,923
16	57,410,232	193,552,493	5,166,921	5,166,921	14,921,036	25,254,878
17	53,557,118	205,561,896	4,820,141	4,820,141	15,883,395	25,523,676
18	49,772,057	217,768,325	4,479,485	4,479,485	16,865,333	25,824,303
19	45,999,411	230,236,033	4,139,947	4,139,947	17,871,008	26,150,902
20	42,334,656	242,878,440	3,810,119	3,810,119	18,893,211	26,513,449
21	38,833,539	255,648,982	3,495,019	3,495,019	19,927,955	26,917,992
22	35,386,474	268,666,730	3,184,783	3,184,783	20,984,785	27,354,350
23	32,038,303	281,896,630	2,883,447	2,883,447	22,060,935	27,827,829
24	28,826,385	295,311,434	2,594,375	2,594,375	23,153,906	28,342,655
25	25,760,935	308,911,363	2,318,484	2,318,484	24,263,048	28,900,016
26	22,823,197	322,725,951	2,054,088	2,054,088	25,389,980	29,498,155
27	20,057,122	336,722,373	1,805,141	1,805,141	26,531,556	30,141,838
28	17,538,684	350,836,144	1,578,482	1,578,482	27,682,319	30,839,282
29	15,211,361	365,135,649	1,369,022	1,369,022	28,847,344	31,585,389
30	13,052,374	379,655,914	1,174,714	1,174,714	30,028,979	32,378,406
31	11,100,106	394,371,201	999,010	999,010	31,224,921	33,222,940
32	9,319,589	409,329,535	838,763	838,763	32,438,755	34,116,281
33	7,679,160	424,576,061	691,124	691,124	33,673,778	35,056,027
34	6,202,723	440,100,793	558,245	558,245	34,929,034	36,045,524
35	4,891,245	455,917,135	440,212	440,212	36,205,359	37,085,783
36	3,740,786	472,043,866	336,671	336,671	37,504,053	38,177,395
37	2,778,498	488,469,155	250,065	250,065	38,824,124	39,324,254
38	1,991,605	505,221,598	179,244	179,244	40,167,725	40,526,214
39	1,363,705	522,333,927	122,733	122,733	41,537,478	41,782,945
40	899,968	539,817,837	80,997	80,997	42,934,601	43,096,595
41	566,602	557,724,531	50,994	50,994	44,363,472	44,465,460
42	336,910	576,098,685	30,322	30,322	45,828,098	45,888,742
43	190,979	594,978,773	17,188	17,188	47,332,073	47,366,449
44	102,115	614,410,654	9,190	9,190	48,879,450	48,897,831
45	53,670	634,430,764	4,830	4,830	50,473,511	50,483,172
46	26,474	655,078,704	2,383	2,383	52,117,627	52,122,392
47	11,157	676,384,939	1,004	1,004	53,814,313	53,816,321
48	4,567	698,374,403	411	411	55,565,572	55,566,394
49	1,777	721,074,509	160	160	57,373,561	57,373,881
50	735	744,510,530	66	66	59,240,240	59,240,372



Single Discount Rate Development Projection of Plan Fiduciary Net Position ending December 31 for 2022 to 2071

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.250%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
1	\$ 393,687,417	\$ 27,087,776	\$ 35,704,108	\$ 440,517	\$ 28,219,771	\$ 412,850,339
2	412,850,339	26,510,732	37,570,658	412,247	29,523,059	430,901,225
3	430,901,225	26,040,129	39,297,683	387,102	30,754,374	448,010,944
4	448,010,944	25,610,515	41,150,557	362,991	31,914,395	464,022,305
5	464,022,305	25,224,610	42,786,051	339,944	33,004,046	479,124,965
6	479,124,965	24,928,064	44,130,518	319,072	34,041,286	493,644,726
7	493,644,726	24,728,932	45,480,307	300,447	35,039,466	507,632,370
8	507,632,370	24,582,356	46,602,437	282,760	36,009,014	521,338,542
9	521,338,542	24,499,373	48,235,276	266,351	36,942,186	534,278,475
10	534,278,475	24,482,005	49,751,727	251,267	37,826,240	546,583,725
11	546,583,725	24,506,781	51,104,341	236,770	38,671,595	558,420,989
12	558,420,989	24,569,080	52,511,772	222,693	39,482,390	569,737,994
13	569,737,994	24,678,203	53,828,427	209,303	40,260,343	580,638,809
14	580,638,809	24,823,041	55,052,705	196,262	41,012,671	591,225,555
15	591,225,555	25,014,923	56,210,480	183,897	41,746,250	601,592,351
16	601,592,351	25,254,878	57,352,636	172,231	42,466,125	611,788,487
17	611,788,487	25,523,676	58,514,681	160,671	43,173,943	621,810,755
18	621,810,755	25,824,303	59,620,484	149,316	43,872,285	631,737,543
19	631,737,543	26,150,902	60,825,331	137,998	44,561,101	641,486,217
20	641,486,217	26,513,449	61,849,341	127,004	45,244,713	651,268,034
21	651,268,034	26,917,992	62,654,000	116,501	45,940,018	661,355,543
22	661,355,543	27,354,350	63,440,368	106,159	46,659,265	671,822,631
23	671,822,631	27,827,829	64,168,430	96,115	47,409,419	682,795,334
24	682,795,334	28,342,655	64,747,646	86,479	48,202,990	694,506,855
25	694,506,855	28,900,016	65,277,534	77,283	49,053,382	707,105,437
26	707,105,437	29,498,155	65,755,489	68,470	49,971,373	720,751,007
27	720,751,007	30,141,838	66,064,342	60,171	50,972,898	735,741,229
28	735,741,229	30,839,282	66,178,387	52,616	52,080,736	752,430,244
29	752,430,244	31,585,389	66,095,489	45,634	53,320,464	771,194,973
30	771,194,973	32,378,406	65,790,570	39,157	54,720,241	792,463,894
31	792,463,894	33,222,940	65,297,986	33,300	56,310,069	816,665,617
32	816,665,617	34,116,281	64,618,010	27,959	58,120,919	844,256,849
33	844,256,849	35,056,027	63,735,899	23,037	60,186,346	875,740,285
34	875,740,285	36,045,524	62,674,131	18,608	62,542,110	911,635,179
35	911,635,179	37,085,783	61,438,855	14,674	65,225,675	952,493,108
36	952,493,108	38,177,395	60,083,653	11,222	68,275,143	998,850,770
37	998,850,770	39,324,254	58,582,402	8,335	71,730,490	1,051,314,776
38	1,051,314,776	40,526,214	56,930,943	5,975	75,635,842	1,110,539,914
39	1,110,539,914	41,782,945	55,158,201	4,091	80,037,628	1,177,198,195
40	1,177,198,195	43,096,595	53,258,931	2,700	84,984,834	1,252,017,993
41	1,252,017,993	44,465,460	51,268,044	1,700	90,528,965	1,335,742,674
42	1,335,742,674	45,888,742	49,203,299	1,011	96,723,257	1,429,150,364
43	1,429,150,364	47,366,449	47,077,555	573	103,623,670	1,533,062,355
44	1,533,062,355	48,897,831	44,917,842	306	111,288,760	1,648,330,797
45	1,648,330,797	50,483,172	42,740,008	161	119,779,756	1,775,853,555
46	1,775,853,555	52,122,392	40,565,028	79	129,161,004	1,916,571,845
47	1,916,571,845	53,816,321	38,403,063	33	139,500,412	2,071,485,482
48	2,071,485,482	55,566,394	36,259,313	14	150,870,333	2,241,662,883
49	2,241,662,883	57,373,881	34,142,842	5	163,347,950	2,428,241,866
50	2,428,241,866	59,240,372	32,059,472	2	177,015,604	2,632,438,368



Single Discount Rate Development Present Values of Projected Benefits ending December 31 for 2022 to 2071

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 ^{(a)-.5}	(g)=(e)*vf ^{(a)-.5}	(h)=(c)/(1+SDR) ^{(a)-.5}
1	\$ 393,687,417	\$ 35,704,108	\$ 35,704,108	\$ -	\$ 34,476,211	\$ -	\$ 34,476,211
2	412,850,339	37,570,658	37,570,658	-	33,826,171	-	33,826,171
3	430,901,225	39,297,683	39,297,683	-	32,989,345	-	32,989,345
4	448,010,944	41,150,557	41,150,557	-	32,209,587	-	32,209,587
5	464,022,305	42,786,051	42,786,051	-	31,225,856	-	31,225,856
6	479,124,965	44,130,518	44,130,518	-	30,029,899	-	30,029,899
7	493,644,726	45,480,307	45,480,307	-	28,856,319	-	28,856,319
8	507,632,370	46,602,437	46,602,437	-	27,569,499	-	27,569,499
9	521,338,542	48,235,276	48,235,276	-	26,606,498	-	26,606,498
10	534,278,475	49,751,727	49,751,727	-	25,587,851	-	25,587,851
11	546,583,725	51,104,341	51,104,341	-	24,506,773	-	24,506,773
12	558,420,989	52,511,772	52,511,772	-	23,479,439	-	23,479,439
13	569,737,994	53,828,427	53,828,427	-	22,441,167	-	22,441,167
14	580,638,809	55,052,705	55,052,705	-	21,400,066	-	21,400,066
15	591,225,555	56,210,480	56,210,480	-	20,373,068	-	20,373,068
16	601,592,351	57,352,636	57,352,636	-	19,381,850	-	19,381,850
17	611,788,487	58,514,681	58,514,681	-	18,437,812	-	18,437,812
18	621,810,755	59,620,484	59,620,484	-	17,516,314	-	17,516,314
19	631,737,543	60,825,331	60,825,331	-	16,662,279	-	16,662,279
20	641,486,217	61,849,341	61,849,341	-	15,797,476	-	15,797,476
21	651,268,034	62,654,000	62,654,000	-	14,921,213	-	14,921,213
22	661,355,543	63,440,368	63,440,368	-	14,087,169	-	14,087,169
23	671,822,631	64,168,430	64,168,430	-	13,285,630	-	13,285,630
24	682,795,334	64,747,646	64,747,646	-	12,499,349	-	12,499,349
25	694,506,855	65,277,534	65,277,534	-	11,749,784	-	11,749,784
26	707,105,437	65,755,489	65,755,489	-	11,035,724	-	11,035,724
27	720,751,007	66,064,342	66,064,342	-	10,338,050	-	10,338,050
28	735,741,229	66,178,387	66,178,387	-	9,655,848	-	9,655,848
29	752,430,244	66,095,489	66,095,489	-	8,991,844	-	8,991,844
30	771,194,973	65,790,570	65,790,570	-	8,345,325	-	8,345,325
31	792,463,894	65,297,986	65,297,986	-	7,722,930	-	7,722,930
32	816,665,617	64,618,010	64,618,010	-	7,125,882	-	7,125,882
33	844,256,849	63,735,899	63,735,899	-	6,553,478	-	6,553,478
34	875,740,285	62,674,131	62,674,131	-	6,008,675	-	6,008,675
35	911,635,179	61,438,855	61,438,855	-	5,492,072	-	5,492,072
36	952,493,108	60,083,653	60,083,653	-	5,007,860	-	5,007,860
37	998,850,770	58,582,402	58,582,402	-	4,552,665	-	4,552,665
38	1,051,314,776	56,930,943	56,930,943	-	4,125,244	-	4,125,244
39	1,110,539,914	55,158,201	55,158,201	-	3,726,611	-	3,726,611
40	1,177,198,195	53,258,931	53,258,931	-	3,355,051	-	3,355,051
41	1,252,017,993	51,268,044	51,268,044	-	3,011,314	-	3,011,314
42	1,335,742,674	49,203,299	49,203,299	-	2,694,674	-	2,694,674
43	1,429,150,364	47,077,555	47,077,555	-	2,403,968	-	2,403,968
44	1,533,062,355	44,917,842	44,917,842	-	2,138,633	-	2,138,633
45	1,648,330,797	42,740,008	42,740,008	-	1,897,382	-	1,897,382
46	1,775,853,555	40,565,028	40,565,028	-	1,679,092	-	1,679,092
47	1,916,571,845	38,403,063	38,403,063	-	1,482,147	-	1,482,147
48	2,071,485,482	36,259,313	36,259,313	-	1,304,812	-	1,304,812
49	2,241,662,883	34,142,842	34,142,842	-	1,145,594	-	1,145,594
50	2,428,241,866	32,059,472	32,059,472	-	1,002,975	-	1,002,975

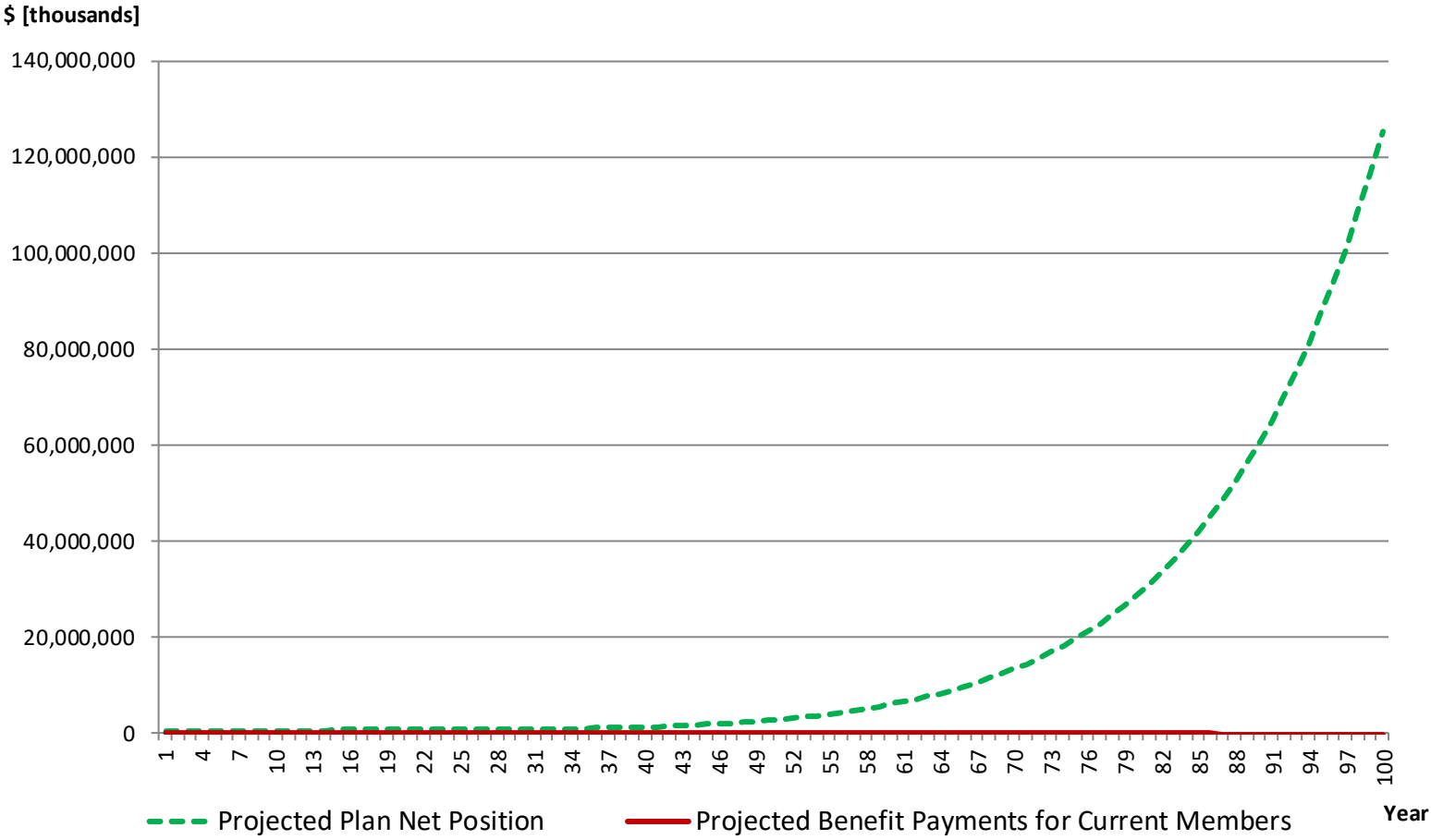


Single Discount Rate Development Present Values of Projected Benefits ending December 31 for 2072 to 2121(concluded)

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 ^a ((a)-.5)	(g)=(e)*vf ^a ((a)-.5)	(h)=((c)/(1+SDR)) ^a (a-.5)
51	\$ 2,632,438,368	\$ 30,014,616	\$ 30,014,616	\$ -	\$ 875,526	\$ -	\$ 875,526
52	2,855,552,665	28,013,254	28,013,254	-	761,908	-	761,908
53	3,098,976,099	26,060,310	26,060,310	-	660,878	-	660,878
54	3,364,197,834	24,160,789	24,160,789	-	571,289	-	571,289
55	3,652,811,928	22,319,290	22,319,290	-	492,071	-	492,071
56	3,966,525,453	20,540,162	20,540,162	-	422,234	-	422,234
57	4,307,167,032	18,827,216	18,827,216	-	360,860	-	360,860
58	4,676,696,292	17,183,701	17,183,701	-	307,094	-	307,094
59	5,077,214,028	15,612,589	15,612,589	-	260,155	-	260,155
60	5,510,972,803	14,116,562	14,116,562	-	219,326	-	219,326
61	5,980,388,349	12,698,044	12,698,044	-	183,950	-	183,950
62	6,488,051,755	11,359,266	11,359,266	-	153,432	-	153,432
63	7,036,742,469	10,102,140	10,102,140	-	127,228	-	127,228
64	7,629,442,388	8,928,209	8,928,209	-	104,842	-	104,842
65	8,269,351,013	7,838,521	7,838,521	-	85,824	-	85,824
66	8,959,901,840	6,833,343	6,833,343	-	69,761	-	69,761
67	9,704,780,234	5,912,236	5,912,236	-	56,277	-	56,277
68	10,507,942,525	5,074,168	5,074,168	-	45,035	-	45,035
69	11,373,636,377	4,317,379	4,317,379	-	35,728	-	35,728
70	12,306,422,761	3,639,403	3,639,403	-	28,081	-	28,081
71	13,311,199,524	3,037,277	3,037,277	-	21,851	-	21,851
72	14,393,226,431	2,507,550	2,507,550	-	16,821	-	16,821
73	15,558,152,040	2,046,230	2,046,230	-	12,798	-	12,798
74	16,812,042,564	1,648,900	1,648,900	-	9,616	-	9,616
75	18,161,412,722	1,310,836	1,310,836	-	7,128	-	7,128
76	19,613,258,709	1,027,052	1,027,052	-	5,207	-	5,207
77	21,175,093,503	792,309	792,309	-	3,745	-	3,745
78	22,854,984,741	601,171	601,171	-	2,650	-	2,650
79	24,661,595,277	448,142	448,142	-	1,842	-	1,842
80	26,604,226,546	327,841	327,841	-	1,256	-	1,256
81	28,692,864,904	235,110	235,110	-	840	-	840
82	30,938,231,208	165,109	165,109	-	550	-	550
83	33,351,833,910	113,410	113,410	-	352	-	352
84	35,946,025,899	76,099	76,099	-	220	-	220
85	38,734,065,374	49,836	49,836	-	135	-	135
86	41,730,181,068	31,824	31,824	-	80	-	80
87	44,949,642,236	19,795	19,795	-	46	-	46
88	48,408,833,750	11,984	11,984	-	26	-	26
89	52,125,336,660	7,059	7,059	-	14	-	14
90	56,118,014,676	4,045	4,045	-	8	-	8
91	60,407,107,016	2,253	2,253	-	4	-	4
92	65,014,328,055	1,219	1,219	-	2	-	2
93	69,962,974,268	639	639	-	1	-	1
94	75,278,039,013	325	325	-	0	-	0
95	80,986,335,678	160	160	-	0	-	0
96	87,116,629,814	75	75	-	0	-	0
97	93,699,780,881	33	33	-	0	-	0
98	100,768,894,289	14	14	-	0	-	0
99	108,359,484,502	5	5	-	0	-	0
100	116,509,649,968	3	3	-	0	-	0
Totals					\$ 696,621,166	\$ -	\$ 696,621,166



PROJECTION OF PLAN NET POSITION AND BENEFIT PAYMENTS



SECTION H

GLOSSARY OF TERMS

Glossary of Terms

Accrued Service	Service credited under the system that was rendered before the date of the actuarial valuation.
Actuarial Accrued Liability (AAL)	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."
Actuarial Assumptions	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.
Actuarial Cost Method	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.
Actuarial Equivalent	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.
Actuarial Gain (Loss)	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.
Actuarial Present Value (APV)	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.
Actuarial Valuation	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.
Actuarial Valuation Date	The date as of which an actuarial valuation is performed.
Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)	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

Amortization Method	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).
Amortization Payment	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
Cost-of-Living Adjustments	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)	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.
Covered-Employee Payroll	The payroll of employees that are provided with pensions through the pension plan.
Deferred Inflows and Outflows	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.
Deferred Retirement Option Program (DROP)	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.

Glossary of Terms

Discount Rate

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:

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
2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

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 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.

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.

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

Multiple-Employer Defined Benefit Pension Plan

A multiple-employer plan is a defined benefit pension plan that is used to provide pensions 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 Pension Liability (NPL)

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



Glossary of Terms

Other Postemployment Benefits (OPEB)	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.
Real Rate of Return	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
Service Cost	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.
Total Pension Expense	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">1. Service Cost2. Interest on the Total Pension Liability3. Current-Period Benefit Changes4. Employee Contributions (made negative for addition here)5. Projected Earnings on Plan Investments (made negative for addition here)6. Pension Plan Administrative Expense7. Other Changes in Plan Fiduciary Net Position8. Recognition of Outflow (Inflow) of Resources due to Liabilities9. Recognition of Outflow (Inflow) of Resources due to Assets
Total Pension Liability (TPL)	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
Unfunded Actuarial Accrued Liability (UAAL)	The UAAL is the difference between actuarial accrued liability and valuation assets.
Valuation Assets	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.

