# Vermont Municipal Employees' Retirement System

Governmental Accounting Standards Board Statement 67 Actuarial Valuation Report as of June 30, 2022



December 5, 2022

Board of Trustees Vermont Municipal Employees' Retirement System Montpelier, Vermont 05609

Dear Board Members:

We are pleased to submit this Governmental Accounting Standards Board (GASB) Statement No. 67 Accounting Valuation as of June 30, 2022, for the Vermont Municipal Employees' Retirement System, a cost-sharing multiple-employer defined benefit pension plan, based on a June 30, 2022, measurement date. It contains the actuarial information that will need to be disclosed in order to comply with GASB 67.

It is important to note that GASB 67 only defines pension liability for financial reporting purposes and does not apply to contribution amounts for pension funding purposes. The assumptions used in this valuation are the same as those in the Actuarial Valuation and Review report as of June 30, 2021, dated October 29, 2021, except as noted herein. Additional details can be found in that report.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist the Board and the member units in preparing their financial reports. The financial information on which our calculations were based was provided by the Office of the State Treasurer. That assistance is gratefully acknowledged.

The measurements shown in this actuarial valuation may not be applicable for other purposes. 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; and changes in plan provisions or applicable law.

The actuarial calculations were directed under the supervision of Matthew A. Strom, FSA, MAAA, EA. I am a member of the American Academy of Actuaries and I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of my knowledge, the information supplied in this actuarial valuation is complete and accurate.

The assumptions used in this actuarial valuation were approved by the Board based upon our analysis and recommendations. In our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the System and are appropriate for purposes of the valuation.

We look forward to reviewing this report with you and to answering any questions.

Sincerely,

Segal

Kathleen A. Riley, FSA, MAAA, EA Senior Vice President and Chief Actuary

Matthew A. Strom, FSA, MAAA, EA Senior Vice President and Actuary

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# Section 1: Valuation Summary

#### Important information about actuarial valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal relies on a number of input items. These include:

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by the System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the market value of assets as of the valuation date, as provided by the System. The System uses an "actuarial value of assets" that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan's assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.



#### Section 1: Valuation Summary

Modeling	Segal valuation results are based on proprietary actuarial modeling software. The actuarial valuation models
	generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and
	client requirements. Deterministic cost projections are based on a proprietary forecasting model. Our Actuarial
	Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial
	development and maintenance of these models. The models have a modular structure that allows for a high degree
	of accuracy, flexibility and user control. The client team programs the assumptions and the plan provisions, validates
	the models, and reviews test lives and results, under the direction of the supervising actuary.

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

The actuarial valuation is prepared at the request of the Vermont Municipal Employees' Retirement System. Segal is not responsible for the use or misuse of its report, particularly by any other party.

An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

Sections of this report may include actuarial results that are not rounded, but that does not imply precision.

If the System is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.

Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The System should look to their other advisors for expertise in these areas.

As Segal has no discretionary authority with respect to the management or assets of the System, it is not a fiduciary in its capacity as actuaries and consultants with respect to the System.



#### Section 1: Valuation Summary

#### **Purpose and basis**

This report has been prepared by Segal to present certain disclosure information required by Governmental Accounting Standards Board Statement No. 67 as of June 30, 2022. This report, based on unaudited financial information as of June 30, 2022, provided by the Office of the State Treasurer and the Vermont Municipal Employees' Retirement System Actuarial Report as of June 30, 2021, dated October 29, 2021, reflects:

- The benefit provisions of the Pension Plan, as administered by the Board; and
- The characteristics of covered active members, inactive members, and retired members and beneficiaries as of June 30, 2021, provided by the Office of the State Treasurer.

The assumptions are the same as shown in the Vermont Municipal Employees' Retirement System Actuarial Valuation Report as of June 30, 2021, except as noted herein.

#### **Highlights of the valuation**

The following key findings were the result of this actuarial valuation:

- The Net Pension Liability (NPL) is equal to the difference between the Total Pension Liability (TPL) and the Plan's Fiduciary Net Position. The Plan's Fiduciary Net Position is equal to the market value of assets and, therefore, the NPL measure is very similar to an Unfunded Actuarial Accrued Liability (UAAL) on a market value basis. The NPL increased from \$147.2 million as of June 30, 2021, to \$303.4 million as of June 30, 2022, and the Plan's Fiduciary Net Position as a percent of the TPL decreased from 86.29% to 73.60%.
- The NPL, measured as of June 30, 2022, and June 30, 2021, was determined based upon the results of the actuarial valuations as of June 30, 2021, and June 30, 2020, respectively, adjusted forward using standard actuarial techniques.
- The discount rate used to determine the TPL and NPL as of June 30, 2022, and June 30, 2021, was 7.00%.
- At the November 17, 2020, Board meeting, the Board voted unanimously to authorize employer contribution rate increases of 0.50% each year for a period of four years, beginning July 1, 2022. In 2022, the Legislature passed H.740, which effectively split the Board-authorized increases evenly between members and employers by including an increase in the employee rate of 0.25% for each group for four years, beginning July 1, 2022. Details on the specific increases are located in the June 30, 2022, Actuarial Valuation and Review report dated October 25, 2022.



#### Exhibit 1 – Net Pension Liability

The components of the Net Pension Liability of the Vermont Municipal Employees' Retirement System are as follows:

	June 30, 2022	June 30, 2021
Total Pension Liability	\$1,149,351,427	\$1,073,218,528
Plan Fiduciary Net Position	845,979,471	926,034,330
System's Net Pension Liability	303,371,956	147,184,198
Plan Fiduciary Net Position as a percentage of the Total Pension Liability $^{*}$	73.60%	86.29%

\* These funded percentages are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligation or the need for or the amount of future contributions.

Actuarial assumptions. The Total Pension Liability as of June 30, 2022, was determined by rolling forward the Total Pension Liability as of June 30, 2021, to June 30, 2022, using the following actuarial assumptions:

Investment rate of return	7.00%, net of pension plan investment expenses, including inflation
Inflation	2.30%
Salary increases	Varying service-based rates from 0-10 years of service, then a single rate of 4.50% (includes assumed inflation rate of 2.30%) for all subsequent years.
Cost of Living Adjustments	1.10% for Group A members and 1.20% for Groups B, C and D members. The January 1, 2022, COLA was 2.00% for Group A members and 2.30% for Groups B, C, and D members. The January 1, 2023, COLA is expected to be 2.00% for Group A and 3.00% for Groups B, C, and D.
Mortality	<ul> <li>Pre-Retirement:</li> <li>Groups A/B/C – 40% PubG-2010 General Employee Amount-Weighted below-median and 60% of PubG-2010 General Employee Amount-Weighted, with generational projection using Scale MP-2019.</li> <li>Group D – PubG-2010 General Employee Amount-Weighted above-median, with generational projection using scale MP-2019.</li> </ul>



Mortality (continued)	Healthy Post-Retirement - Retirees:
	<ul> <li>Groups A/B/C – 104% of 40% PubG-2010 General Healthy Retiree Amount-Weighted below-median and 60% of PubG-2010 General Healthy Retiree Amount-Weighted, with generational projection using scale MP-2019.</li> </ul>
	<ul> <li>Group D – PubG-2010 General Healthy Retiree Amount-Weighted, with generational projection using scale MP-2019.</li> </ul>
	Healthy Post-Retirement - Beneficiaries:
	<ul> <li>Groups A/B/C – 70% Pub-2010 Contingent Survivor Amount-Weighted below-median and 30% of Pub-2010 Contingent Survivor Amount-Weighted, with generational projection using scale MP-2019.</li> </ul>
	<ul> <li>Group D – Pub-2010 Contingent Survivor Amount-Weighted, with generational projection using scale MP-2019.</li> </ul>
	Disabled Post-Retirement:
	<ul> <li>All Groups – PubNS-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table with generational projection using Scale MP-2019.</li> </ul>
	The tables with the generational projection to the ages of members as of the measurement date reasonably reflect the mortality experience of the System as of the measurement date.
	The mortality rates were based on historical and current demographic data, adjusted to reflect health characteristics of the underlying groups and estimated future experience and professional judgment. The mortality tables were then adjusted to future years using the generational projection to reflect future mortality improvement between the measurement date and those years.

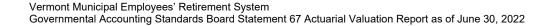


#### Determination of discount rate and investment rates of return

The long-term expected rate of return on pension plan investments was determined using a building-block method in which bestestimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges 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. Best estimates of arithmetic real rates of return for each major asset class included in the pension plan's target asset allocation as of June 30, 2022, are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return <sup>*</sup>
Passive Global Equities	24.00%	4.30%
Active Global Equities	5.00%	4.30%
Large Cap US Equities	4.00%	3.25%
Small/Mid Cap US Equities	3.00%	3.75%
Non-US Developed Market Equities	7.00%	5.00%
Private Equity	10.00%	6.50%
Emerging Market Debt	4.00%	3.50%
Private and alternative Credit	10.00%	4.75%
Non-Core Real Estate	4.00%	6.00%
Core Fixed Income	19.00%	0.00%
Core Real Estate	3.00%	3.50%
US TIPS	3.00%	-0.50%
Infrastructure/Farmland	<u>4.00%</u>	4.25%
	100.00%	

\* Calculated as the Arithmetic Rates of Return minus the Rate of Inflation, as provided by the Vermont State Treasurers' Office





*Discount rate:* The long-term expected rate of return on pension plan investments is 7.00%. The high quality tax-exempt general obligation municipal bond rate (20-Bond GO Index) as of the closest date prior to the valuation date of June 30, 2022, is 3.54%, as published by The Bond Buyer.

The discount rate used to measure the Total Pension Liability was 7.00% as of June 30, 2022. The projection of cash flows used to determine the discount rate assumed plan member and employer contributions will be made at rates set by the Board (employers) and statute (members). At the November 17, 2020, Board meeting, the Board voted unanimously to authorize employer contribution rate increases of 0.50% each year for a period of four years, beginning July 1, 2022. In 2022, the Legislature passed H.740, which effectively split the Board-authorized increases evenly between members and employers by including an increase in the employee rate of 0.25% for each group for four years, beginning July 1, 2022. For this purpose, only employer contributions that are intended to fund benefits of current plan members and their beneficiaries are included. Projected employer contributions that are intended to fund the service costs of future plan members and their beneficiaries, as well as projected contributions from future plan members, are not included. Based on those assumptions, the pension plans' Fiduciary Net Position was projected to be available to make all projected future benefit payments of current plan members as of June 30, 2022. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the Total Pension Liability.

#### **Discount rate sensitivity**

Sensitivity of the Net Pension Liability to changes in the discount rate. The following presents the Net Pension Liability, calculated using the discount rate of 7.00%, as well as what the Net Pension Liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.00%) or 1-percentage-point higher (8.00%) than the current rate:

	1% Decrease	Current Discount	1% Increase
	(6.00%)	Rate (7.00%)	(8.00%)
Net Pension Liability as of June 30, 2022	\$454,589,557	\$303,371,956	\$178,989,197



# Exhibit 2 – Schedule of changes in Net Pension Liability – last ten fiscal years

		١	/ear End June 30,		
	2022	2021	2020	2019	2018
Total Pension Liability					
Service cost	\$39,576,266	\$37,158,549	\$34,726,405	\$30,744,435	\$28,434,045
Interest	76,210,791	70,595,483	67,360,649	61,617,803	56,503,328
Differences between expected and actual experience	8,120,277	15,794,755	8,291,943	17,467,646	14,172,418
Changes of assumptions	0	0	38,774,448	0	0
Changes of benefit terms	363,972	0	0	0	193,575
Benefit payments, including refunds of employee contributions	<u>-48,138,407</u>	<u>-43,357,218</u>	<u>-39,084,124</u>	<u>-35,397,043</u>	<u>-31,444,463</u>
Net change in Total Pension Liability	\$76,132,899	\$80,191,569	\$110,069,321	\$74,432,841	\$67,858,903
Total Pension Liability – beginning	<u>1,073,218,528</u>	<u>993,026,959</u>	<u>882,957,638</u>	<u>808,524,797</u>	<u>740,665,894</u>
Total Pension Liability – ending (a)	\$1,149,351,427	\$1,073,218,528	\$993,026,959	\$882,957,638	\$808,524,797
Plan Fiduciary Net Position					
Contributions – employer	\$25,217,676	\$22,297,570	\$20,680,856	\$19,202,981	\$17,519,690
Contributions – employee	25,025,242	23,074,402	20,771,304	19,777,956	19,166,537
Net investment income	-81,507,765	184,850,095	29,113,786	38,740,356	43,889,050
Benefit payments, including refunds of employee contributions	-48,138,407	-43,357,218	-39,084,124	-35,397,043	-31,444,463
Administrative expenses	-1,302,589	-1,248,639	-1,354,418	-1,158,070	-928,741
Other	<u>650,984</u>	<u>365,225</u>	<u>459,660</u>	<u>450,746</u>	<u>136,490</u>
Net change in Fiduciary Net Position	-\$80,054,859	\$185,981,435	\$30,587,064	\$41,616,926	\$48,338,563
Plan Fiduciary Net Position – beginning	<u>926,034,330</u>	740,052,895	<u>709,465,831</u>	<u>667,848,905</u>	<u>619,510,342</u>
Plan Fiduciary Net Position – ending (b)	\$845,979,471	\$926,034,330	\$740,052,895	\$709,465,831	\$667,848,905
Net Pension Liability – ending: (a)-(b)	\$303,371,956	\$147,184,198	\$252,974,064	\$173,491,807	\$140,675,892
Plan's Fiduciary Net Position as a percentage of the Total Pension Liability	73.60%	86.29%	74.52%	80.35%	82.60%
Covered-employee payroll	\$331,960,355	\$327,491,743	\$306,103,224	\$289,838,838	\$274,813,707
Net Pension Liability as a percentage of covered-employee payroll	91.39%	44.94%	82.64%	59.86%	51.19%

Note: Covered-employee payroll reflects actual compensation amounts from the prior Plan year.

# Exhibit 2 – Schedule of changes in Net Pension Liability – last ten fiscal years *(continued)*

		١	/ear End June 30,		
	2017	2016	2015	2014	2013*
Total Pension Liability					
Service cost	\$27,245,986	\$25,264,340	\$24,366,167	\$22,519,428	
Interest	54,779,918	49,744,271	46,058,159	42,139,031	
Differences between expected and actual experience	-3,749,037	1,088,020	3,046,272	0	
Changes of assumptions	14,481,136	12,203,982	19,192,039	0	
Changes of benefit terms	0	0	0	0	
Benefit payments, including refunds of employee contributions	-27,803,390	-25,588,884	<u>-23,315,175</u>	-20,601,380	
Net change in Total Pension Liability	\$64,954,613	\$62,711,729	\$69,347,462	\$44,057,079	
Total Pension Liability – beginning	<u>675,711,281</u>	<u>612,999,552</u>	<u>543,652,090</u>	<u>499,595,011</u>	
Total Pension Liability – ending (a)	\$740,665,894	\$675,711,281	\$612,999,552	\$543,652,090	
Plan Fiduciary Net Position					
Contributions – employer	\$16,481,881	\$15,235,742	\$14,136,067	\$12,805,737	
Contributions – employee	25,210,413	15,226,948	13,587,975	13,233,728	
Net investment income	59,486,928	6,776,933	-2,358,518	64,346,116	
Benefit payments, including refunds of employee contributions	-27,803,390	-25,588,884	-23,315,175	-20,601,380	
Administrative expenses	-874,707	-755,013	-950,625	-588,022	
Other	<u>-5,897</u>	<u>215,646</u>	<u>278,541</u>	<u>2,142,868</u>	
Net change in Fiduciary Net Position	\$72,495,228	\$11,111,372	\$1,378,265	\$71,339,047	
Plan Fiduciary Net Position – beginning	<u>547,015,114</u>	<u>535,903,742</u>	<u>534,525,477</u>	463,186,430	
Plan Fiduciary Net Position – ending (b)	\$619,510,342	\$547,015,114	\$535,903,742	\$534,525,477	
Net Pension Liability – ending: (a)-(b)	\$121,155,552	\$128,696,167	\$77,095,810	\$9,126,613	
Plan's Fiduciary Net Position as a percentage of the Total Pension Liability	83.64%	80.95%	87.42%	98.32%	
Covered-employee payroll	\$256,730,055	\$249,810,907	\$230,969,202	\$220,371,643	
Net Pension Liability as a percentage of covered-employee payroll	47.19%	51.52%	33.38%	4.14%	

Historical information prior to implementation of GASB 67/68 is not required.

Note: Covered-employee payroll reflects actual compensation amounts from the prior Plan year.



#### Notes to Exhibit 2:

*Changes in Assumptions:* There have been no changes in actuarial assumptions since the last measurement date.

*Changes in Plan Provisions:* At the November 17, 2020, Board meeting, the Board voted unanimously to authorize employer contribution rate increases of 0.50% each year for a period of four years, beginning July 1, 2022. In 2022, the Legislature passed H.740, which effectively split the Board-authorized increases evenly between members and employers by including an increase in the employee rate of 0.25% for each group for four years, beginning July 1, 2022.



#### Exhibit 3 – Schedule of contributions – last ten fiscal years

			Year End June 30		
	2022	2021	2020	2019	2018
Actuarially determined contribution	\$39,451,313	\$36,722,301	\$22,618,468	\$17,263,214	\$15,066,601
Contributions in relation to the actuarially determined contribution*	<u>25,217,676</u>	<u>22,297,570</u>	<u>20,680,856</u>	<u>19,202,981</u>	<u>17,519,690</u>
Contribution deficiency (excess)	\$14,233,637	\$14,424,731	\$1,937,612	-\$1,939,767	-\$2,453,089
Covered-employee payroll	\$331,960,355	\$327,491,743	\$306,103,224	\$289,838,838	\$274,813,707
Contributions as a percentage of covered-employee payroll	7.60%	6.81%	6.76%	6.63%	6.38%
	2017	2016	2015	2014	2013**
Actuarially determined contribution	\$12,895,672	\$15,235,742	\$11,956,121	\$11,638,928	
Contributions in relation to the actuarially determined contribution*	<u>16,481,881</u>	<u>15,235,742</u>	14,136,067	12,805,737	
Contribution deficiency (excess)	-\$3,586,209	\$0	-\$2,179,946	-\$1,166,809	
Covered-employee payroll	\$256,730,055	\$249,810,907	\$230,969,202	\$220,371,643	
Contributions as a percentage of covered-employee payroll	6.42%	6.10%	6.12%	5.81%	

\* Includes a portion of the contribution amount denoted as "other" in Exhibit 2.

\*\* Historical information prior to implementation of GASB 67/68 is not required.

Note: Actuarially determined contributions for a given fiscal year are based on results from the June 30 actuarial valuation one year prior.



#### Notes to Exhibit 3:

Valuation date	Actuarially determined contribution for the year ending June 30, 2022, is based on results from the June 30, 2021, actuarial valuation, and was calculated as of June 30, with appropriate interest to the middle of the fiscal year.
Actuarial cost method	Entry age Normal cost method
Amortization method	Amortization payments calculated to fully fund unfunded actuarial accrued liability with annual increases of 3% over a closed period.
Remaining amortization period	17 years as of July 1, 2021 The amortization of unfunded actuarial accrued liability (UAAL) within the actuarially determined contribution rate calculation is based on the level percentage of pay required to amortize the UAAL over the 30-year closed period that began July 1, 2008.
Asset valuation method	A smoothing method is used, under which the value of assets for actuarial purposes equals market value less a five- year phase-in of the differences between actual and assumed investment return. The value of assets for actuarial purposes may not differ from market value of assets by more than 20%.
Actuarial assumptions:	
Investment rate of return	7.00%, net of pension plan investment expenses, including inflation
Inflation rate	2.30% per year
Projected salary increases	Varying service-based rates from 0-10 years of service, then a single rate of 4.50% (includes assumed inflation rate of 2.30%) for all subsequent years.
Mortality	Pre-Retirement:
	<ul> <li>Groups A/B/C – 40% PubG-2010 General Employee Amount-Weighted below-median and 60% of PubG-2010 General Employee Amount-Weighted, with generational projection using Scale MP-2019.</li> </ul>
	<ul> <li>Group D – PubG-2010 General Employee Amount-Weighted above-median, with generational projection using scale MP-2019.</li> </ul>
	Healthy Post-Retirement - Retirees:
	<ul> <li>Groups A/B/C – 104% of 40% PubG-2010 General Healthy Retiree Amount-Weighted below-median and 60% of PubG-2010 General Healthy Retiree Amount-Weighted, with generational projection using scale MP-2019.</li> </ul>
	<ul> <li>Group D – PubG-2010 General Healthy Retiree Amount-Weighted, with generational projection using scale MP- 2019.</li> </ul>
	Healthy Post-Retirement - Beneficiaries:
	<ul> <li>Groups A/B/C – 70% Pub-2010 Contingent Survivor Amount-Weighted below-median and 30% of Pub-2010 Contingent Survivor Amount-Weighted, with generational projection using scale MP-2019.</li> </ul>
	• Group D – Pub-2010 Contingent Survivor Amount-Weighted, with generational projection using scale MP-2019.



Mortality (continued)	Disabled Post-Retirement:
	<ul> <li>All Groups – PubNS-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table with generational projection using Scale MP-2019.</li> </ul>
	The tables with the generational projection to the ages of members as of the measurement date reasonably reflect the mortality experience of the System as of the measurement date.
	The mortality rates were based on historical and current demographic data, adjusted to reflect health characteristics of the underlying groups and estimated future experience and professional judgment. The mortality tables were then adjusted to future years using the generational projection to reflect future mortality improvement between the measurement date and those years.
Other assumptions	Same as those used in the June 30, 2021, funding actuarial valuation.



#### **Exhibit 4 – Development of Blended Discount Rate**

Fiscal Year Beginning	Projected Beginning Fiduciary Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expense	Projected Investment Earnings	Projected Ending Fiduciary Net Position
2021*	\$926,034,330	\$50,242,918	\$48,138,407	\$1,302,589	-\$80,856,781	\$845,979,471
2022	845,979,471	44,472,611	55,014,953	1,228,527	58,806,583	893,015,185
2023	893,015,185	44,062,265	59,604,091	1,185,140	61,925,619	938,213,838
2024	938,213,838	44,098,174	63,723,943	1,158,321	64,947,526	982,377,274
2025	982,377,274	44,452,781	68,205,648	1,142,475	67,895,072	1,025,377,004
2026	1,025,377,004	42,902,781	73,057,180	1,133,427	70,681,316	1,064,770,494
2027	1,064,770,494	41,594,093	77,654,965	1,130,468	73,232,238	1,100,811,392
2028	1,100,811,392	40,503,158	82,316,255	1,133,016	75,553,683	1,133,418,962
2029	1,133,418,962	39,507,495	86,968,298	1,138,758	77,638,343	1,162,457,744
2030	1,162,457,744	38,605,014	91,605,254	1,146,639	79,476,901	1,187,787,766
2031	1,187,787,766	37,790,550	95,941,638	1,156,246	81,069,387	1,209,549,819
2032	1,209,549,819	37,067,631	100,268,325	1,168,416	82,415,568	1,227,596,277
2033	1,227,596,277	36,371,057	104,446,628	1,181,972	83,507,725	1,241,846,459
2034	1,241,846,459	35,715,396	108,324,505	1,195,548	84,346,089	1,252,387,891
2035	1,252,387,891	35,145,611	111,986,552	1,210,258	84,935,360	1,259,272,052
2036	1,259,272,052	34,683,342	115,356,173	1,226,280	85,282,575	1,262,655,516
2037	1,262,655,516	34,273,178	118,445,806	1,242,474	85,396,358	1,262,636,772
2038	1,262,636,772	33,950,427	121,310,639	1,259,207	85,282,894	1,259,300,247
2039	1,259,300,247	33,677,462	124,227,762	1,276,854	84,937,067	1,252,410,160
2040	1,252,410,160	33,442,304	126,654,093	1,294,354	84,360,996	1,242,265,013
2041	1,242,265,013	33,264,828	128,913,168	1,311,391	83,564,960	1,228,870,242
2042	1,228,870,242	33,137,383	130,996,915	1,328,232	82,549,345	1,212,231,823
2043	1,212,231,823	33,036,568	132,666,943	1,344,476	81,322,108	1,192,579,080
2044	1,192,579,080	33,027,437	134,096,512	1,360,665	79,895,495	1,170,044,835
2045	1,170,044,835	33,033,855	135,234,592	1,375,449	78,277,972	1,144,746,621
2046	1,144,746,621	33,091,751	135,873,010	1,388,672	76,486,316	1,117,063,006
2047	1,117,063,006	33,205,600	136,402,750	1,401,413	74,533,461	1,086,997,904
2048	1,086,997,904	33,351,591	136,577,957	1,412,304	72,427,500	1,054,786,734
2049	1,054,786,734	33,567,727	136,539,264	1,421,667	70,181,309	1,020,574,839
2050	1,020,574,839	33,826,604	136,254,046	1,429,449	67,805,248	984,523,196
2051	984,523,196	34,146,151	135,612,252	1,435,748	65,315,059	946,936,406
2052	946,936,406	34,524,031	134,773,420	1,440,116	62,726,416	907,973,317
2053	907,973,317	34,948,900	133,546,042	1,441,956	60,056,764	867,990,983
2054	867,990,983	35,442,951	131,999,853	1,441,981	57,329,408	827,321,508
2055	827,321,508	35,996,423	130,132,177	1,439,693	54,567,365	786,313,426
2056	786,313,426	36,608,465	128,009,510	1,435,046	51,792,677	745,270,012
2057	745,270,012	37,285,087	125,637,792	1,427,889	49,026,580	704,515,998
2058	704,515,998	38,036,265	122,948,620	1,418,114	46,294,553	664,480,082

\* First year values in this projection reflect actual experience; first year investment earnings include "other" income.



#### Exhibit 4 – Development of Blended Discount Rate continued

Fiscal Year Beginning	Projected Beginning Fiduciary Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expense	Projected Investment Earnings	Projected Ending Fiduciary Net Position
2059	\$664,480,082	\$38,865,403	\$120,009,624	\$1,406,015	\$43,624,347	\$625,554,193
2060	625,554,193	39,748,941	116,974,307	1,391,458	41,037,205	587,974,574
2061	587,974,574	40,694,282	113,542,032	1,373,871	38,560,463	552,313,416
2062	552,313,416	41,726,581	110,046,273	1,354,061	36,223,358	518,863,021
2063	518,863,021	42,820,612	106,343,395	1,331,562	34,050,509	488,059,185
2064	488,059,185	43,981,111	102,573,528	1,306,648	32,067,676	460,227,796
2065	460,227,796	45,204,964	98,600,278	1,279,365	30,302,332	435,855,449
2066	435,855,449	46,489,699	94,549,977	1,249,671	28,784,033	415,329,533
2067	415,329,533	47,840,564	90,567,794	1,217,808	27,534,991	398,919,486
2068	398,919,486	49,239,474	86,419,402	1,183,629	26,581,640	387,137,569
2069	387,137,569	50,695,061	82,237,668	1,147,348	25,955,481	380,403,095
2070	380,403,095	52,204,950	78,068,993	1,108,844	25,684,166	379,114,374
2071	379,114,374	53,764,830	73,931,958	1,068,720	25,794,752	383,673,278
2072	383,673,278	55,374,450	69,853,759	1,026,768	26,314,417	394,481,618
2073	394,481,618	57,034,624	65,820,395	983,205	27,271,799	411,984,441
2074	411,984,441	58,745,592	61,839,371	940,250	28,697,720	436,648,132
2075	436,648,132	60,507,959	57,920,877	898,027	30,624,486	468,961,673
2076	468,961,673	62,323,198	54,070,469	856,658	33,086,180	509,443,924
2077	509,443,924	64,192,894	50,297,656	816,253	36,118,839	558,641,748
2078	558,641,748	66,118,681	46,605,800	776,906	39,760,681	617,138,404
2079	617,138,404	68,102,241	43,014,027	738,695	44,051,921	685,539,844
2080	685,539,844	70,145,309	39,523,905	701,682	49,034,979	764,494,545
2081	764,494,545	72,249,668	36,154,225	665,916	54,754,652	854,678,724
2082	854,678,724	74,417,158	32,910,800	631,431	61,258,133	956,811,784
2083	956,811,784	76,649,673	29,806,086	598,252	68,595,412	1,071,652,531
2084	1,071,652,531	78,949,163	26,850,424	566,391	76,819,309	1,200,004,188
2085	1,200,004,188	81,317,638	24,055,183	535,851	85,985,724	1,342,716,516
2086	1,342,716,516	83,757,167	21,424,636	506,625	96,154,063	1,500,696,485
2087	1,500,696,485	86,269,882	18,969,495	478,702	107,387,513	1,674,905,683
2088	1,674,905,683	88,857,978	16,689,759	452,061	119,753,463	1,866,375,304
2089	1,866,375,304	91,523,718	14,591,610	426,677	133,323,961	2,076,204,696
2090	2,076,204,696	94,269,429	12,680,200	402,522	148,175,863	2,305,567,266
2091	2,305,567,266	97,097,512	10,944,182	379,562	164,391,791	2,555,732,825
2092	2,555,732,825	100,010,438	9,375,010	357,761	182,061,016	2,828,071,508
2093	2,828,071,508	103,010,751	7,986,103	337,080	201,279,070	3,124,038,146
2094	3,124,038,146	106,101,073	6,759,728	317,481	222,148,505	3,445,210,515
2095	3,445,210,515	109,284,105	5,694,816	298,921	244,779,899	3,793,280,782
2096	3,793,280,782	112,562,629	4,779,362	281,360	269,292,221	4,170,074,910
2097	4,170,074,910	115,939,507	3,995,040	264,755	295,814,034	4,577,568,656



#### Exhibit 4 – Development of Blended Discount Rate continued

Fiscal Year Beginning	Projected Beginning Fiduciary Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expense	Projected Investment Earnings	Projected Ending Fiduciary Net Position
2098	\$4,577,568,656	\$119,417,693	\$3,333,679	\$249,065	\$324,484,029	\$5,017,887,634
2099	5,017,887,634	123,000,223	2,779,805	234,247	355,451,650	5,493,325,455
2100	5,493,325,455	126,690,230	2,340,801	220,262	388,877,303	6,006,331,925
2101	6,006,331,925	130,490,937	1,984,733	207,070	424,933,704	6,559,564,763
2102	6,559,564,763	134,405,665	1,699,003	194,631	463,807,454	7,155,884,248
2103	7,155,884,248	138,437,835	1,470,130	182,907	505,699,365	7,798,368,411
2104	7,798,368,411	142,590,970	1,315,647	171,861	550,824,410	8,490,296,283
2105	8,490,296,283	146,868,699	1,182,898	161,459	599,414,092	9,235,234,717
2106	9,235,234,717	151,274,760	1,089,747	151,666	651,717,597	10,036,985,661
2107	10,036,985,661	155,813,003	1,025,570	142,449	708,001,571	10,899,632,216
2108	10,899,632,216	160,487,393	934,647	133,777	768,553,919	11,827,605,104
2109	11,827,605,104	165,302,015	862,959	125,619	833,683,328	12,825,601,869
2110	12,825,601,869	170,261,075	799,630	117,948	903,719,153	13,898,664,519
2111	13,898,664,519	175,368,908	736,453	110,735	979,014,777	15,052,201,016
2112	15,052,201,016	180,629,975	679,930	103,954	1,059,948,684	16,291,995,791
2113	16,291,995,791	186,048,874	628,408	97,582	1,146,926,006	17,624,244,681
2114	17,624,244,681	191,630,340	541,209	91,594	1,240,382,041	19,055,624,259
2115	19,055,624,259	197,379,251	418,775	85,967	1,340,784,306	20,593,283,074
2116	20,593,283,074	203,300,628	316,087	80,682	1,448,631,450	22,244,818,383
2117	22,244,818,383	209,399,647	177,125	75,718	1,564,457,425	24,018,422,612
2118	24,018,422,612	215,681,636	101,177	71,055	1,688,832,412	25,922,764,428
2119	25,922,764,428	222,152,085	57,445	66,677	1,822,364,489	27,967,156,880
2120	27,967,156,880	228,816,648	26,685	62,566	1,965,706,440	30,161,590,717
2121	30,161,590,717	235,681,147	9,333	58,706	2,119,557,809	32,516,761,634
2122	32,516,761,634	242,751,582	378	55,082	2,284,667,679	35,044,125,435
2123	35,044,125,435	250,034,129	40	51,680	2,461,838,165	37,755,946,009
2124	37,755,946,009	257,535,153	25	48,487	2,651,928,253	40,665,360,903
2125	40,665,360,903	265,261,208	15	45,490	2,855,857,813	43,786,434,419
2126	43,786,434,419	273,219,044	9	42,678	3,074,611,582	47,134,222,358
2127	47,134,222,358	281,415,615	5	40,038	3,309,243,710	50,724,841,640
2128	50,724,841,640	289,858,084	3	37,561	3,560,882,633	54,575,544,793
2129	54,575,544,793	298,553,826	1	35,236	3,830,736,286	58,704,799,668
2130	58,704,799,668	307,510,441	1	33,055	4,120,097,685	63,132,374,738
2131	63,132,374,738	316,735,754	0	0	4,430,351,983	67,879,462,475



#### Exhibit 4 – Development of Blended Discount Rate continued

Fiscal Year Beginning	Projected Beginning Fiduciary Net Position	Projected Benefit Payments	"Funded" Portion of Benefit	"Unfunded" Portion of Benefit	Present Value of "Funded" Benefit Payments at 7.00%	Present Value of "Unfunded" Benefit Payments at 3.54%*	Present Value of Benefit Payments at 7.00%
2021	\$926,034,330	\$48,138,407	\$48,138,407	\$0	\$46,537,155	\$0	\$46,537,155
2022	845,979,471	55,014,953	55,014,953	0	49,705,572	0	49,705,572
2023	893,015,185	59,604,091	59,604,091	0	50,328,806	0	50,328,806
2024	938,213,838	63,723,943	63,723,943	0	50,287,427	0	50,287,427
2025	982,377,274	68,205,648	68,205,648	0	50,302,937	0	50,302,937
2026	1,025,377,004	73,057,180	73,057,180	0	50,356,105	0	50,356,105
2027	1,064,770,494	77,654,965	77,654,965	0	50,023,569	0	50,023,569
2028	1,100,811,392	82,316,255	82,316,255	0	49,557,258	0	49,557,258
2029	1,133,418,962	86,968,298	86,968,298	0	48,932,664	0	48,932,664
2030	1,162,457,744	91,605,254	91,605,254	0	48,169,761	0	48,169,761
2031	1,187,787,766	95,941,638	95,941,638	0	47,149,540	0	47,149,540
2032	1,209,549,819	100,268,325	100,268,325	0	46,052,193	0	46,052,193
2033	1,227,596,277	104,446,628	104,446,628	0	44,832,938	0	44,832,938
2034	1,241,846,459	108,324,505	108,324,505	0	43,455,596	0	43,455,596
2035	1,252,387,891	111,986,552	111,986,552	0	41,985,671	0	41,985,671
2036	1,259,272,052	115,356,173	115,356,173	0	40,419,626	0	40,419,626
2037	1,262,655,516	118,445,806	118,445,806	0	38,787,104	0	38,787,104
2038	1,262,636,772	121,310,639	121,310,639	0	37,126,395	0	37,126,395
2039	1,259,300,247	124,227,762	124,227,762	0	35,531,928	0	35,531,928
2040	1,252,410,160	126,654,093	126,654,093	0	33,855,994	0	33,855,994
2041	1,242,265,013	128,913,168	128,913,168	0	32,205,485	0	32,205,485
2042	1,228,870,242	130,996,915	130,996,915	0	30,585,096	0	30,585,096
2043	1,212,231,823	132,666,943	132,666,943	0	28,948,611	0	28,948,611
2044	1,192,579,080	134,096,512	134,096,512	0	27,346,308	0	27,346,308
2045	1,170,044,835	135,234,592	135,234,592	0	25,774,203	0	25,774,203
2046	1,144,746,621	135,873,010	135,873,010	0	24,201,755	0	24,201,755
2047	1,117,063,006	136,402,750	136,402,750	0	22,706,647	0	22,706,647
2048	1,086,997,904	136,577,957	136,577,957	0	21,248,424	0	21,248,424
2049	1,054,786,734	136,539,264	136,539,264	0	19,852,714	0	19,852,714
2050	1,020,574,839	136,254,046	136,254,046	0	18,515,181	0	18,515,181
2051	984,523,196	135,612,252	135,612,252	0	17,222,401	0	17,222,401
2052	946,936,406	134,773,420	134,773,420	0	15,996,142	0	15,996,142
2053	907,973,317	133,546,042	133,546,042	0	14,813,519	0	14,813,519
2054	867,990,983	131,999,853	131,999,853	0	13,684,121	0	13,684,121
2055	827,321,508	130,132,177	130,132,177	0	12,607,947	0	12,607,947
2056	786,313,426	128,009,510	128,009,510	0	11,590,926	0	11,590,926
2057	745,270,012	125,637,792	125,637,792	0	10,631,937	0	10,631,937
2058	704,515,998	122,948,620	122,948,620	0	9,723,710	0	9,723,710
2059	664,480,082	120,009,624	120,009,624	0	8,870,348	0	8,870,348

\* Bond Buyer's 20-Bond GO index

Vermont Municipal Employees' Retirement System Governmental Accounting Standards Board Statement 67 Actuarial Valuation Report as of June 30, 2022



#### Exhibit 4 – Development of Blended Discount Rate continued

Fiscal Year Beginning	Projected Beginning Fiduciary Net Position	Projected Benefit Payments	"Funded" Portion of Benefit	"Unfunded" Portion of Benefit	Present Value of "Funded" Benefit Payments at 7.00%	Present Value of "Unfunded" Benefit Payments at 3.54%*	Present Value of Benefit Payments at 7.00%
2060	\$625,554,193	\$116,974,307	\$116,974,307	\$0	\$8,080,370	\$0	\$8,080,370
2061	587,974,574	113,542,032	113,542,032	0	7,330,164	0	7,330,164
2062	552,313,416	110,046,273	110,046,273	0	6,639,702	0	6,639,702
2063	518,863,021	106,343,395	106,343,395	0	5,996,529	0	5,996,529
2064	488,059,185	102,573,528	102,573,528	0	5,405,563	0	5,405,563
2065	460,227,796	98,600,278	98,600,278	0	4,856,239	0	4,856,239
2066	435,855,449	94,549,977	94,549,977	0	4,352,107	0	4,352,107
2067	415,329,533	90,567,794	90,567,794	0	3,896,082	0	3,896,082
2068	398,919,486	86,419,402	86,419,402	0	3,474,416	0	3,474,416
2069	387,137,569	82,237,668	82,237,668	0	3,089,994	0	3,089,994
2070	380,403,095	78,068,993	78,068,993	0	2,741,458	0	2,741,458
2071	379,114,374	73,931,958	73,931,958	0	2,426,339	0	2,426,339
2072	383,673,278	69,853,759	69,853,759	0	2,142,522	0	2,142,522
2073	394,481,618	65,820,395	65,820,395	0	1,886,740	0	1,886,740
2074	411,984,441	61,839,371	61,839,371	0	1,656,658	0	1,656,658
2075	436,648,132	57,920,877	57,920,877	0	1,450,171	0	1,450,171
2076	468,961,673	54,070,469	54,070,469	0	1,265,204	0	1,265,204
2077	509,443,924	50,297,656	50,297,656	0	1,099,928	0	1,099,928
2078	558,641,748	46,605,800	46,605,800	0	952,517	0	952,517
2079	617,138,404	43,014,027	43,014,027	0	821,597	0	821,597
2080	685,539,844	39,523,905	39,523,905	0	705,546	0	705,546
2081	764,494,545	36,154,225	36,154,225	0	603,171	0	603,171
2082	854,678,724	32,910,800	32,910,800	0	513,140	0	513,140
2083	956,811,784	29,806,086	29,806,086	0	434,329	0	434,329
2084	1,071,652,531	26,850,424	26,850,424	0	365,663	0	365,663
2085	1,200,004,188	24,055,183	24,055,183	0	306,165	0	306,165
2086	1,342,716,516	21,424,636	21,424,636	0	254,845	0	254,845
2087	1,500,696,485	18,969,495	18,969,495	0	210,880	0	210,880
2088	1,674,905,683	16,689,759	16,689,759	0	173,398	0	173,398
2089	1,866,375,304	14,591,610	14,591,610	0	141,682	0	141,682
2090	2,076,204,696	12,680,200	12,680,200	0	115,068	0	115,068
2091	2,305,567,266	10,944,182	10,944,182	0	92,817	0	92,817
2092	2,555,732,825	9,375,010	9,375,010	0	74,307	0	74,307
2093	2,828,071,508	7,986,103	7,986,103	0	59,158	0	59,158
2094	3,124,038,146	6,759,728	6,759,728	0	46,797	0	46,797
2095	3,445,210,515	5,694,816	5,694,816	0	36,846	0	36,846
2096	3,793,280,782	4,779,362	4,779,362	0	28,900	0	28,900
2097	4,170,074,910	3,995,040	3,995,040	0	22,577	0	22,577
2098	4,577,568,656	3,333,679	3,333,679	0	17,607	0	17,607

\* Bond Buyer's 20-Bond GO index

Vermont Municipal Employees' Retirement System Governmental Accounting Standards Board Statement 67 Actuarial Valuation Report as of June 30, 2022



#### Exhibit 4 – Development of Blended Discount Rate continued

Fiscal Year Beginning	Projected Beginning Fiduciary Net Position	Projected Benefit Payments	"Funded" Portion of Benefit	"Unfunded" Portion of Benefit	Present Value of "Funded" Benefit Payments at 7.00%	Present Value of "Unfunded" Benefit Payments at 3.54%*	Present Value of Benefit Payments at 7.00%
2099	\$5,017,887,634	\$2,779,805	\$2,779,805	\$0	\$13,721	\$0	\$13,721
2100	5,493,325,455	2,340,801	2,340,801	0	10,798	0	10,798
2101	6,006,331,925	1,984,733	1,984,733	0	8,557	0	8,557
2102	6,559,564,763	1,699,003	1,699,003	0	6,846	0	6,846
2103	7,155,884,248	1,470,130	1,470,130	0	5,536	0	5,536
2104	7,798,368,411	1,315,647	1,315,647	0	4,630	0	4,630
2105	8,490,296,283	1,182,898	1,182,898	0	3,891	0	3,891
2106	9,235,234,717	1,089,747	1,089,747	0	3,350	0	3,350
2107	10,036,985,661	1,025,570	1,025,570	0	2,946	0	2,946
2108	10,899,632,216	934,647	934,647	0	2,509	0	2,509
2109	11,827,605,104	862,959	862,959	0	2,165	0	2,165
2110	12,825,601,869	799,630	799,630	0	1,875	0	1,875
2111	13,898,664,519	736,453	736,453	0	1,614	0	1,614
2112	15,052,201,016	679,930	679,930	0	1,393	0	1,393
2113	16,291,995,791	628,408	628,408	0	1,203	0	1,203
2114	17,624,244,681	541,209	541,209	0	968	0	968
2115	19,055,624,259	418,775	418,775	0	700	0	700
2116	20,593,283,074	316,087	316,087	0	494	0	494
2117	22,244,818,383	177,125	177,125	0	259	0	259
2118	24,018,422,612	101,177	101,177	0	138	0	138
2119	25,922,764,428	57,445	57,445	0	73	0	73
2120	27,967,156,880	26,685	26,685	0	32	0	32
2121	30,161,590,717	9,333	9,333	0	10	0	10
2122	32,516,761,634	378	378	0	0	0	0
2123	35,044,125,435	40	40	0	0	0	0
2124	37,755,946,009	25	25	0	0	0	0
2125	40,665,360,903	15	15	0	0	0	0
2126	43,786,434,419	9	9	0	0	0	0
2127	47,134,222,358	5	5	0	0	0	0
2128	50,724,841,640	3	3	0	0	0	0
2129	54,575,544,793	1	1	0	0	0	0
2130	58,704,799,668	1	1	0	0	0	0
2131	63,132,374,738	0	0	0	0	0	0
Total					\$1,343,764,619	\$0	\$1,343,764,619

\* Bond Buyer's 20-Bond GO index



#### **Exhibit I: Actuarial Assumptions and Methods**

Rationale for Assumptions:		The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the Actuarial Experience Study dated September 24, 2020 (as prepared by Segal).					
Roll-forward Techniques:		The results as of June 30, 2022, are based on the results of the Vermont Municipal Employees' Retirement System Actuarial Valuation Report as of June 30, 2021, adjusted forward, using standard actuarial techniques.					
Inflation:	2.30%.						
Investment Return:	expectations, and p	rofessional judgment. As p s and anticipated risk pren	rm estimate derived from historical data, current and recent market art of the analysis, a building block approach was used that reflects niums for each of the portfolio's asset classes, as well as the Plan's				
Salary Increases:	Varying service base	ed rates from 0-10 years of	service, then a single rate of 4.50% for all subsequent years.				
	Service	Annual Rate of Salary Increase* (%)					
	0	7.00%					
	1	6.50%					
	2	5.75%					
	3	5.25%					
	4	5.00%					
	5	4.75%	_				
	6	4.75%					
	7	4.75%					
	8	4.75%					
	9	4.75%					
	10+	4.50%					

Includes assumed inflation rate of 2.30%.



Cost-of-Living Adjustments:	members and 1.20 members who electronic retirement benefit, 1, 2023, COLA is a	on January 1 following one year of retirement at the rate of 1.10% per annum for Group A 0% per annum for Groups B, C and D members (beginning at Normal Retirement eligibility age for ct reduced early retirement, at age 62 for members of Groups A, B, and D who receive a disability and at age 55 for members of Group C who receive a disability retirement benefit). The January assumed to be 2.00% for Group A and 3.00% for Groups B, C, and D. The January 1, 2022, % for Group A members and 2.30% for Groups B, C, and D members.
Mortality Rates:	Pre-Retirement:	
	· · · · · · · · · · · · · · · · · · ·	40% PubG-2010 General Employee amount-weighted below-median and 60% of PubG-2010 General Employee amount-weighted, with generational projection using Scale MP-2019.
	· · · · · · · · · · · · · · · · · · ·	PubG-2010 General Employee amount-weighted above-median, with generational projection using scale MP-2019.
	Healthy Post-retire	ement - Retirees:
		104% of 40% PubG-2010 General Healthy Retiree amount-weighted below-median and 60% of PubG-2010 General Healthy Retiree amount-weighted, with generational projection using scale MP-2019.
		PubG-2010 General Healthy Retiree amount-weighted, with generational projection using scale MP-2019.
	Healthy Post-retire	ement - Beneficiaries:
		70% Pub-2010 Contingent Survivor amount-weighted below-median and 30% of Pub-2010 Contingent Survivor amount-weighted, with generational projection using scale MP-2019.
		Pub-2010 Contingent Survivor amount-weighted, with generational projection using scale MP-2019.
	Disabled Post-retin	rement:
		PubNS-2010 Non-Safety Disabled Retiree amount-weighted with generational projection using Scale MP-2019.
		e generational projection to the ages of members as of the measurement date reasonably reflect rience of the System as of the measurement date.
	of the underlying g	s were based on historical and current demographic data, adjusted to reflect health characteristics groups and estimated future experience and professional judgment. The mortality tables were then a years using the generational projection to reflect future mortality improvement between the e and those years.



Withdrawal from Service before Retirement

Assumed annual rates of withdrawal are as follows:

	Rate (%)	
Service	Male	Female
0	22.50%	25.00%
1	16.20	22.00
2	13.50	17.50
3	12.15	15.50
4	10.80	12.00
5	9.00	11.00
6	8.10	10.50
7	7.20	10.00
8	7.20	7.50
9	6.30	7.00
10	3.60	6.00



**Disability Incidence:** 

Representative values of the assumed annual rates of disability incidence are as follows:

	Rate (%) <sup>1</sup>	
Service	Male	Female
25	0.0100%	0.0050%
30	0.0130	0.0065
35	0.0170	0.0085
40	0.0300	0.0150
45	0.0500	0.0250
50	0.0900	0.0450
55	0.1800	0.0900
60	0.3150	0.1575
65	0.3150	0.1575
<b>4 - 4 - 4 - 4</b>		

<sup>1</sup> Disability rates stop after age 55 with 5 or more years of service for Group B, C and D members and after age 55 with 35 or more years of service for Group A members.



#### **Retirement Rates:**

AgeMaleFemaleAgeMale553.00%4.00%6315.00%566.006.006415.00574.006.006545.00584.004.006615.00	
56         6.00         6.00         64         15.00           57         4.00         6.00         65         45.00	Female
57 4.00 6.00 65 45.00	15.00%
	20.00
58         4.00         4.00         66         15.00	20.00
	20.00
595.757.506715.00	20.00
60 7.50 4.00 68 15.00	25.00
6110.007.506915.00	25.00
6222.507.5070100.00	100.00

#### **Retirement Group B**

				•	
Age	Male	Female	Age	Male	Female
55	4.00%	4.00%	63	20.00%	12.50%
56	4.00	4.00	64	20.00	17.50
57	4.00	4.00	65	40.00	27.50
58	4.00	5.00	66	35.00	22.50
59	4.00	5.00	67	30.00	17.50
60	4.00	5.00	68	30.00	17.50
61	14.00	12.50	69	30.00	17.50
62	28.00	17.50	70	100.00	100.00

Retirement Rates: (continued)

	Retirement Group C		
Age	Unisex	Age	Unisex
55	20.00%	63	10.00%
56	10.00	64	22.50
57	10.00	65	35.00
58	15.00	66	35.00
59	17.50	67	35.00
60	15.00	68	35.00
61	10.00	69	35.00
62	20.00	70	100.00

	Retirement Group D				
Age	<20 Years of Service	20+ Years of Service	Age	<20 Years of Service	20+ Years of Service
50	0.00%	40.0%	58	15.0%	10.0%
51	0.00	35.0	59	15.0	10.0
52	0.00	30.0	60	15.0	15.0
53	0.00	25.0	61	10.0	10.0
54	0.00	20.0	62	25.0	25.0
55	20.00	15.0	63	25.0	25.0
56	20.00	10.0	64	25.0	25.0
57	20.00	10.0	65	100.0	100.0

Rates shown are for participants with 5 or more years of service (unless otherwise indicated). For participants with less than 5 years of service, 0% is assumed.



Inactive Members as Reported by the System:Not Vested: Valuation liability equals 100% of accumulated contributions.Vested: Valuation liability based on accrued benefit and members are assumed to retire 10% of the time from their Early Retirement Age until their Normal Retirement Age, than 100% of the time at their Norma age, with deferred vested benefit.			
Deferred Members as Reported by the System:	Assumed to retire 10% of the time each year from their Early Retirement Age until their Normal Retirement Age, than 100% of the time at their Normal Retirement age, with deferred vested benefit.		
Unknown Data for Members:	Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.		
Percent Married:	85% of male members and 50% of female members are assumed to be married.		
Age of Spouse:	Females three years younger than males.		
Benefit Elections:	Non-Group D:All members are assumed to elect the single life annuity.Group D:Single members are assumed to elect the single life annuity. Married members are assumed to elect the 70% joint & survivor option.		
Actuarial Cost Method:	Entry Age Actuarial Cost Method. Entry Age is the age at date of employment or, if date is unknown, current age minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary, with Normal Cost determined using the plan of benefits applicable to each participant.		
Changes in Actuarial Assumptions:	There were no changes in actuarial assumptions since the last valuation.		



### **Exhibit II: Summary of Plan Provisions**

This exhibit summarizes the major provisions of the Plan included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Effective Date:	July 1, 1975.		
Credible Service:	Service as a member plus purchased service.		
Membership:	Full time employees of participating municipalities. Municipality elects coverage under Group A, B, C, or D provisions.		
Average Final Compensation (AFC):	<ul> <li>Group A: Average annual compensation during highest 5 consecutive years.</li> <li>Group B/C: Average annual compensation during highest 3 consecutive years.</li> <li>Group D: Average annual compensation during highest 2 consecutive years.</li> </ul>		
Normal Retirement – Eligibility:	<ul> <li>Group A: Earlier of age 65 with 5 years of service or age 55 with 35 years of service.</li> <li>Group B: Earlier of age 62 with 5 years of service or age 55 with 30 years of service.</li> <li>Groups C/D: Age 55 with 5 years of service.</li> </ul>		
Normal Retirement – Amount:	<ul> <li>Group A: 1.4% of AFC times service.</li> <li>Group B: 1.7% of AFC times service as a Group B member plus percentage earned as a Group A member times AFC.</li> </ul>		
	• Group C: 2.5% of AFC times service as a Group C member plus percentage earned as a Group A or B member times AFC.		
	Group D: 2.5% of AFC times service as a Group D member plus percentage earned as a Group A, B or C member times AFC.		
	Maximum benefit is 60% of AFC for Groups A and B and 50% of AFC for Groups C and D. The above amounts include the portion of the allowance provided by member contributions.		
Early Retirement – Eligibility:	Groups A/B: Age 55 with 5 years of service.		
	Group C: None.		
	Group D: Age 50 with 20 years of service.		
Early Retirement – Amount:	Normal retirement allowance based on service and AFC at early retirement, reduced by 6% for each year commencement precedes Normal Retirement Age for Group A and B members; payable without reduction to Group D members.		



Vesting:	All groups – 5 years of service. Allowance beginning at normal retirement age based on AFC and service at termination. The AFC is to be adjusted annually by one-half of the percentage change in the Consumer Price Index, subject to the limits on "Post-Retirement Adjustments" described below.	
Disability Retirement – Eligibility:	All groups – 5 yea	rs of service and disability as determined by Retirement Board.
Disability Retirement – Amount:	All groups – Immediate allowance based on AFC and service to date of disability. Children's benefit of 10% of AFC payable to up to three minor children (or children up to age 23 if enrolled in full-time studies) of a disabled Group D member.	
Death Benefit – Eligibility:	All groups – Death after 5 years of service.	
Death Benefit – Amount:	Groups A/B/C:	Reduced early retirement allowance under 100% survivor option commencing immediately or, if greater, survivor's benefit under disability allowance computed as of date of death.
	Group D:	70% of the unreduced accrued benefit, plus children's benefit.
Post-Retirement Adjustments:	Group A:	Allowances in pay status for at least one year increased on each January 1 by one-half of the percentage increase in Consumer Price Index, but not more than 2%. If receiving an Early Retirement benefit, no increases until after reaching attaining Normal Retirement eligibility. If receiving a Disability Retirement benefit, no increases until after attaining age 62.
	Groups B/C/D:	Allowances in payment for at least one year increased on each January 1 by one-half of the percentage increase in Consumer Price Index, but not more than 3%. If receiving an Early Retirement benefit, no increases until after reaching attaining Normal Retirement eligibility. If receiving a Disability Retirement benefit, no increases until after attaining age 62 (age 55 for Group C).
Retirement Stipend:	\$25 per month payable at the option of the Retirement Board.	
Optional Benefit and Death after Retirement:	• Group A/B/C:	A lifetime allowance or actuarially equivalent 50% or 100% joint and survivor allowance with refund of contribution guarantee.
	Group D:	A lifetime allowance or 70% contingent annuitant option with no reduction.
Refund of Contributions:	Upon termination, if the member so elects, or if no other benefit is payable, the member's accumulated contributions with interest are refunded.	



Member Contribution Rates:	Group A	3.25% effective July 1, 2021; 3.50% effective July 1, 2022; 3.75% effective July 1, 2023; 4.00% effective July 1, 2024; 4.25% effective July 1, 2025, and thereafter.
	Group B	5.625% effective July 1, 2021; 5.875% effective July 1, 2022; 6.125% effective July 1, 2023; 6.375% effective July 1, 2024; 6.625% effective July 1, 2025, and thereafter.
	Group C	10.75% effective July 1, 2021; 11.00% effective July 1, 2022; 11.25% effective July 1, 2023; 11.50% effective July 1, 2024; 11.75% effective July 1, 2025, and thereafter.
	Group D	12.10% effective July 1, 2021; 12.35% effective July 1, 2022; 12.60% effective July 1, 2023; 12.85% effective July 1, 2024; 13.10% effective July 1, 2025, and thereafter.
Employer Contribution Rates:	Group A	4.75% effective July 1, 2021; 5.00% effective July 1, 2022; 5.25% effective July 1, 2023; 5.50% effective July 1, 2024; 5.75% effective July 1, 2025, and thereafter.
	Group B	6.25% effective July 1, 2021; 6.50% effective July 1, 2022; 6.75% effective July 1, 2023; 7.00% effective July 1, 2024; 7.25% effective July 1, 2025, and thereafter.
	Group C	8.00% effective July 1, 2021; 8.25% effective July 1, 2022; 8.50% effective July 1, 2023; 8.75% effective July 1, 2024; 9.00% effective July 1, 2025, and thereafter.
	Group D	10.60% effective July 1, 2021; 10.85% effective July 1, 2022; 11.10% effective July 1, 2023; 11.35% effective July 1, 2024; 11.60% effective July 1, 2025, and thereafter.
Changes in Plan Provisions:		e future contribution rate increases shown above, there were no other changes ons since the prior valuation.



Definitions of certain terms as they are used in Statements 67/68. The terms may have different meanings in other contexts.

Active Employees:	Individuals employed at the end of the reporting or measurement period, as applicable.
Actual Contributions:	Cash contributions recognized as additions to a pension Plan Fiduciary Net Position.
Actuarial Present Value of Projected Benefit Payments:	Projected benefit payments discounted to reflect the expected effects of the time value (present value) of money and the probabilities of payment.
Actuarial Valuation:	The determination, as of a point in time (the actuarial valuation date), of the service cost, Total Pension Liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB.
Actuarial Valuation Date:	The date as of which an actuarial valuation is performed.
Actuarially Determined Contribution:	A target or recommended contribution to a defined benefit pension plan for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted.
Ad Hoc Cost-of-Living Adjustments (Ad Hoc COLAs):	Cost-of-living adjustments that require a decision to grant by the authority responsible for making such decisions.
Ad Hoc Postemployment Benefit Changes:	Postemployment benefit changes that require a decision to grant by the authority responsible for making such decisions.
Agent Employer:	An employer whose employees are provided with pensions through an agent multiple-employer defined benefit pension plan.
Agent Multiple-Employer Defined Benefit Pension Plan (Agent Pension Plan):	A multiple-employer defined benefit pension plan in which pension plan assets are pooled for investment purposes but separate accounts are maintained for each individual employer so that each employer's share of the pooled assets is legally available to pay the benefits of only its employees.
Allocated Insurance Contract:	A contract with an insurance company under which related payments to the insurance company are currently used to purchase immediate or deferred annuities for individual employees. Also may be referred to as an annuity contract.



Automatic Cost-of-Living Adjustments (Automatic COLAs):	Cost-of-living adjustments that occur without a requirement for a decision to grant by a responsible authority, including those for which the amounts are determined by reference to a specified experience factor (such as the earnings experience of the pension plan) or to another variable (such as an increase in the consumer price index).
Automatic Postemployment Benefit Changes:	Postemployment benefit changes that occur without a requirement for a decision to grant by a responsible authority, including those for which the amounts are determined by reference to a specified experience factor (such as the earnings experience of the pension plan) or to another variable (such as an increase in the consumer price index).
Closed Period:	A specific number of years that is counted from one date and declines to zero with the passage of time. For example, if the recognition period initially is five years on a closed basis, four years remain after the first year, three years after the second year, and so forth.
Collective Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions:	Deferred outflows of resources and deferred inflows of resources related to pensions arising from certain changes in the collective Net Pension Liability.
Collective Net Pension Liability:	The Net Pension Liability for benefits provided through (1) a cost-sharing pension plan or (2) a single-employer or agent pension plan in circumstances in which there is a special funding situation.
Collective Pension Expense:	Pension expense arising from certain changes in the collective Net Pension Liability.
Contributions:	Additions to a pension plan's Fiduciary Net Position for amounts from employers, nonemploye contributing entities (for example, state government contributions to a local governmen pension plan), or employees. Contributions can result from cash receipts by the pension plan or from recognition by the pension plan of a receivable from one of these sources.
Cost-of-Living Adjustments:	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
Cost-Sharing Employer:	An employer whose employees are provided with pensions through a cost-sharing multiple- employer defined benefit pension plan.
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 Retirement Option Program (DROP):	A program that permits an employee to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The employee continues to provide service to the employer and is paid for that service by the employer after the DROP entry date; however, the pensions that would have been paid to the employee (if the employee had retired and not entered the DROP) are credited to an individual employee account within the defined benefit pension plan until the end of the DROP period.
Defined Benefit Pension Plans:	Pension plans that are used to provide defined benefit pensions.
Defined Benefit Pensions:	Pensions for which the income or other benefits that the employee will receive at or after separation from employment are defined by the benefit terms. The pensions may be stated as a specified dollar amount or as an amount that is calculated based on one or more factors such as age, years of service, and compensation. (A pension that does not meet the criteria of a defined contribution pension is classified as a defined benefit pension for purposes of Statements 67/68.)
Defined Contribution Pension Plans:	Pension plans that are used to provide defined contribution pensions.
Defined Contribution Pensions:	Pensions having terms that (1) provide an individual account for each employee; (2) define the contributions that an employer is required to make (or the credits that it is required to provide) to an active employee's account for periods in which that employee renders service; and (3) provide that the pensions an employee will receive will depend only on the contributions (or credits) to the employee's account, actual earnings on investments of those contributions (or credits), and the effects of forfeitures of contributions (or credits) made for other employees, as well as pension plan administrative costs, that are allocated to the employee's account.
Discount Rate:	The single rate of return that, when applied to all projected benefit payments, results in an actuarial present value of projected benefit payments equal to the total of the following: 1. The actuarial present value of benefit payments projected to be made in future periods in which (a) the amount of the pension plan's Fiduciary Net Position is projected (under the
	requirements of Statements 67/68) to be greater than the benefit payments that are projected to be made in that period and (b) pension plan assets up to that point are expected to be invested using a strategy to achieve the long-term expected rate of return, calculated using the long-term expected rate of return on pension plan investments.
	2. The actuarial present value of projected benefit payments not included in (1), calculated using the municipal bond rate.



Entry Age Actuarial Cost Method:	A method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age(s). The portion of this actuarial present value allocated to a valuation year is called the <i>normal cost</i> . The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is called the <i>actuarial accrued liability</i> .	
Inactive Employees: Terminated individuals that have accumulated benefits but are not yet recerning benefits.		
Measurement Period:	The period between the prior and the current measurement dates.	
Multiple-Employer Defined Benefit Pension Plan:	A defined benefit pension plan that is used to provide pensions to the employees of more than one employer.	
Net Pension Liability (NPL):	The liability of employers and non-employer contributing entities to employees for benefits provided through a defined benefit pension plan.	
Non-Employer Contributing Entities:	Entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of Statements 67/68, employees are not considered non-employer contributing entities.	
Other Postemployment Benefits:	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits, regardless of the manner in which they are provided. Other postemployment benefits do not include termination benefits.	
Pension Plans:	Arrangements through which pensions are determined, assets dedicated for pensions are accumulated and managed and benefits are paid as they come due.	
Pensions:	Retirement income and, if provided through a pension plan, postemployment benefits other than retirement income (such as death benefits, life insurance, and disability benefits). Pensions do not include postemployment healthcare benefits and termination benefits.	
Plan Members:	Individuals that are covered under the terms of a pension plan. Plan members generally include (1) employees in active service (active plan members) and (2) terminated employees who have accumulated benefits but are not yet receiving them and retirees or their beneficiaries currently receiving benefits (inactive plan members).	
Postemployment	The period after employment.	
Postemployment Benefit Changes:	Adjustments to the pension of an inactive employee.	
Postemployment Healthcare Benefits:	Medical, dental, vision, and other health-related benefits paid subsequent to the termination of employment.	



Projected Benefit Payments:	All benefits estimated to be payable through the pension plan to current active and inactive employees as a result of their past service and their expected future service.	
Public Employee Retirement System:	A special-purpose government that administers one or more pension plans; also ma administer other types of employee benefit plans, including postemployment healthcare plan and deferred compensation plans.	
Real Rate of Return:	The rate of return on an investment after adjustment to eliminate inflation.	
Service Costs:	The portions of the actuarial present value of projected benefit payments that are attributed to valuation years.	
Single Employer:	An employer whose employees are provided with pensions through a single-employer defined benefit pension plan.	
Single-Employer Defined Benefit Pension Plan (Single-Employer Pension Plan)	A defined benefit pension plan that is used to provide pensions to employees of only one employer.	
Special Funding Situations:	Circumstances in which a nonemployer entity is legally responsible for making contributions directly to a pension plan that is used to provide pensions to the employees of another entity or entities and either of the following conditions exists:	
	The amount of contributions for which the nonemployer entity legally is responsible is not dependent upon one or more events or circumstances unrelated to the pensions.	
	The nonemployer entity is the only entity with a legal obligation to make contributions directly to a pension plan.	
Termination Benefits:	Inducements offered by employers to active employees to hasten the termination of services, or payments made in consequence of the early termination of services. Termination benefits include early-retirement incentives, severance benefits, and other termination-related benefits.	
Total Pension Liability (TPL):	The portion of the actuarial present value of projected benefit payments that is attributed to past periods of employee service in conformity with the requirements of Statement.	

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