WASHINGTON SUBURBAN SANITARY COMMISSION
EMPLOYEES' RETIREMENT PLAN

ACTUARIAL VALUATION

AS OF

JUNE 30, 2023

April 2024

CONTENTS

EXECUTIVE SUMMARY

This report contains the results of an actuarial valuation of the Washington Suburban Sanitary Commission Employees' Retirement Plan (the Plan) as of June 30, 2023. The contents of this report reflect generally accepted actuarial principles.

This study relies on the following information supplied by WSSC Water: data on plan participants, plan provisions, the amount of contributions, and a reconciliation of the plan's assets from the prior year.

Boomershine Consulting Group did not audit the participant data or financial information used in this report. Based on our review of this information, we believe that it is sufficiently complete and reliable, and that it is appropriate for the purposes intended. No future participants are assumed for this valuation, except for the projections shown in Section 3.

It is our understanding that WSSC Water currently maintains a 16.9% of covered payroll employer contributions to the Plan. This rate is slightly lower than the Actuarially Determined Employer Contribution Rate as defined in Section 1.3 (i.e., with 15-year level percentage of payroll amortization of Unfunded Liability). The financial health of the Plan sponsor is not taken into consideration.

The funding ratio is now 80.6% (AVA basis) and is expected to remain near that level before eventually improving, as shown in Section 3.2. Section 1 contains the results of the valuation, including evaluation of the contribution rate, per the Actuarial Funding Policy. The funding ratio using the market value of assets is 78.5% (i.e., recognizing all investment losses immediately). The funded status is not appropriate for assessing the sufficiency of plan assets to cover the cost of settling the Plan's benefit obligation.

Plan experience since the prior valuation includes the following:

Favorable Experience (Gains)

- *Investment Return.* On a market-value basis, the Plan's return was 10.0% for the year ended June 30, 2023, compared to the assumed rate of 7.0%.
- *Retirements.* The number of active participants who retired during the plan year was 43, compared to the expected 57 retirements.
- *Mortality.* There were 57 deaths among retirees including disabled retirees and beneficiaries, for the plan year, compared to 51 expected. There were 18 new beneficiaries associated with these deaths.
- *Employee Turnover.* The number of active participants who terminated during the plan year for reasons other than retirement, disability, death or leave of absence was 117, which is more than the expected 60 terminations.

The experience gains from these items decreased the actuarial cost and liability of the Plan.

Unfavorable Experience (Losses)

- *Cost-of-Living Adjustments.* Benefits were increased by 4.06% to 6.45% for non-active participants, each of which is greater than the assumed 2.50% cost-of-living increase for retirees.

- *Compensation.* This year's total payroll for continuing active employees increased by 5.44% over the prior valuation, which was more than assumed (weighted average increase of 3.63%).

The experience losses from above increased the actuarial cost and liability of the Plan, and outweighed the experience gains in aggregate.

The net impact of the experience gains and losses for the prior Plan year is an increase in actuarial cost as a percentage of payroll, from 16.9% t0 17.1%.

New Entrants. The number of active participants increased by 0.7% from 1,600 as of June 30, 2022 to 1,611 as of June 30, 2023. This included the net impact of exits and new entrants.

Actuarial Certification

In this study, we conducted an examination of all participant data for reasonableness and consistency, but did not audit such data. Actuarial funding is based on the Entry Age Normal Cost Method. Under this method, the employer contribution provides for current cost (normal cost) plus an amount to amortize the unfunded actuarial accrued liability (UAAL). For actuarial valuation purposes, Plan assets are valued at Actuarial Value, using a method that gradually recognizes investment gains and losses. The plan provisions are the same as those used in the prior valuation. Actuarial assumptions and methods were updated as described herein.

Boomershine Consulting Group (BCG) uses a valuation system that we lease from an external vendor. The valuation software (an actuarial model) was developed and is supported by the independent vendor. BCG's actuarial consultants understand the intended purposes of the model and its operation.

The purpose of the valuation system is to develop actuarial liabilities and costs in accordance with a set of inputs. Inputs are determined by BCG and include actuarial assumptions, actuarial cost method(s), benefit provisions, and participant data. The output from the valuation model includes actuarial accrued liabilities, normal costs, and various present value calculations. For this valuation, BCG has reviewed the model output, including test lives, to ensure that the results are reasonable, valid, and consistent. BCG uses the output from the valuation model to perform the valuation calculations that appear in this report.

We certify that the valuation was performed in accordance with generally accepted actuarial principles and practices. The undersigned are members of the American Academy of Actuaries, and meet the Qualification Standards to provide the actuarial opinions herein.

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SECTION 1: SUMMARY OF VALUATION RESULTS

1.1: Plan Assets

An adjusted market value of assets, or Actuarial Value of Assets (AVA), is used for the valuation to gradually recognize investment gains and losses. This method reflects five-year smoothing, such that 20% of each gain or loss is recognized per year until the entire amount has been recognized.

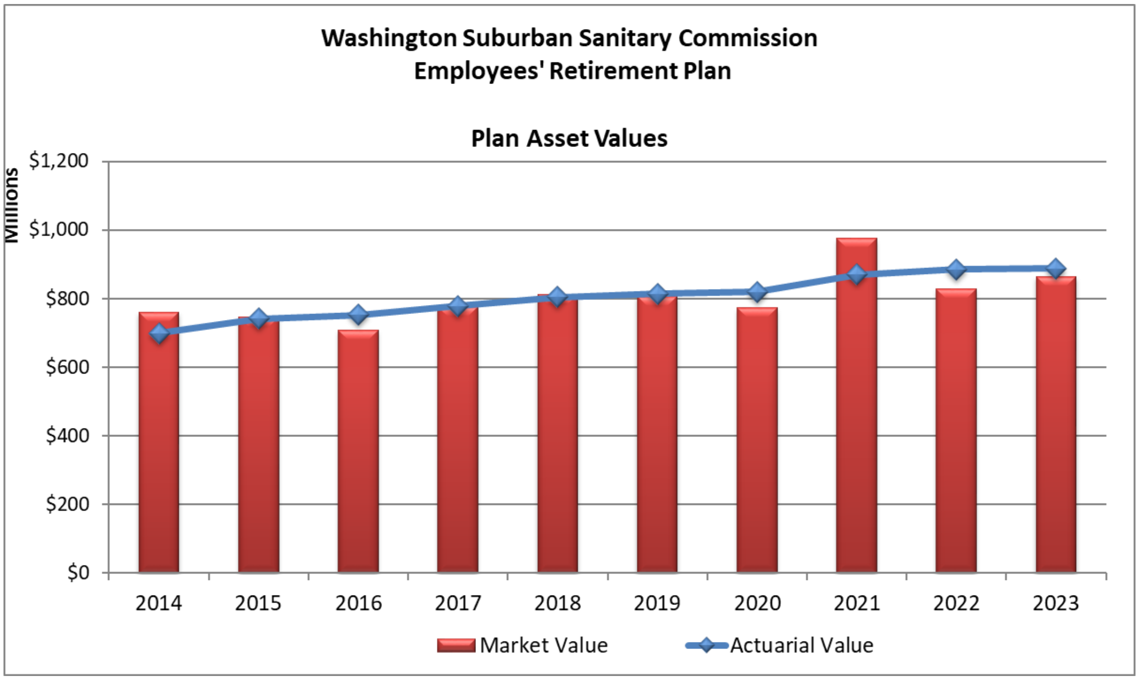
To ensure that the adjusted market value of assets remains reasonably close to the market value, a corridor is applied that requires the adjusted market value of assets be no less than 80% and no more than 120% of the market value.

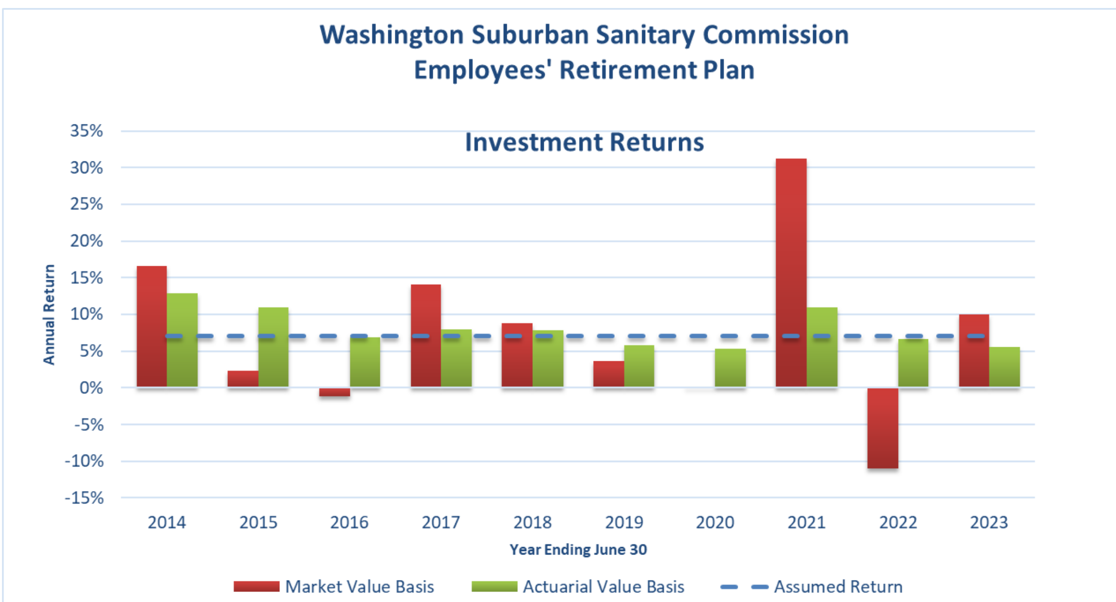
Historical Values

The following table shows the most recent five years of market values as well as smoothed asset values, and the accompanying annual returns.

Year Ending	Market Value		Actuarial Value	
June 30	Value	Annual Return	Value	Annual Return
2019	$807,675,683	3.67%	$814,596,098	5.75%
2020	773,168,364	0.02%	819,689,860	5.27%
2021	974,626,269	31.25%	870,314,780	10.97%
2022	829,319,365	-10.98%	885,515,619	6.69%
2023	865,086,080	10.00%	888,076,563	5.50%
Five Year Compound Return		5.91%		6.82%

As expected, some years the Actuarial Value is greater than the Market Value, and some years it is less. Therefore, the smoothing method has had the intended effect. This can also be seen in the graph below.


Washington Suburban Sanitary Commission
Employees' Retirement Plan
Plan Asset Values
Millions
$1,200
$1,000
$800
$600
$400
$200
$0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Market Value
Actuarial Value


Washington Suburban Sanitary Commission
Employees' Retirement Plan
Investment Returns
Annual Return
35%
30%
25%
20%
15%
10%
5%
0%
-5%
-10%
-15%
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year Ending June 30
Market Value Basis
Actuarial Value Basis
Assumed Return

Earnings Experience for Fund on Plan Year Basis

	Plan Year Ending			
	6/30/2020	6/30/2021	6/30/2022	6/30/2023
Market Basis				
Net Investment Income*	$ 19,880,955	$ 20,836,736	$ 15,538,423	$15,170,210
Capital Gains (Losses)	(19,751,831)	215,321,418	(120,364,083)	65,500,905
Total Income	$ 129,124	$ 236,158,154	$(104,825,660)	$80,671,115
Average Mean Market Value of Assets**	$ 790,357,462	$ 755,818,240	$ 954,385,647	$806,867,165
Rate of Return*				
Net Investment Income	2.52%	2.75%	1.63%	1.88%
Capital Gains (Losses)	-2.50%	28.49%	-12.61%	8.12%
Total Investment Return	0.02%	31.25%	-10.98%	10.00%

* Net of investment expenses
** [Beginning of Year Value + End of Year Value - Total Income] divided by 2
Note: Percentages may not sum to total due to rounding.

Annual Compounded Market Value Rate of Investment Return

	Period Ending on June 30									
Period Beginning July 1	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
2013	16.56%	9.21%	5.66%	7.71%	7.94%	7.21%	6.15%	9.00%	6.58%	6.91%
2014		2.33%	0.60%	4.92%	5.87%	5.43%	4.52%	7.96%	5.39%	5.89%
2015			-1.11%	6.26%	7.09%	6.22%	4.95%	8.93%	5.84%	6.35%
2016				14.12%	11.43%	8.79%	6.52%	11.06%	7.04%	7.46%
2017					8.79%	6.23%	4.11%	10.31%	5.68%	6.39%
2018						3.67%	1.83%	10.83%	4.92%	5.91%
2019							0.02%	14.57%	5.33%	6.48%
2020								31.25%	8.13%	8.72%
2021									-10.98%	-1.04%
2022										10.00%

Statement of Plan Assets (Market Value Basis)

	June 30, 2023	June 30, 2022
1. Cash	$0	$0
2. Investment	865,614,838	829,866,942
3. Subtotal (1 + 2)	$865,614,838	$ 829,866,942
4. Accrued Contributions		
a. Employer	0	0
b. Employee	610,745	267,809
c. Total	610,745	267,809
5. Accrued Income	690,082	546,196
6. Total Assets (3 + 4c + 5)	$866,915,665	$ 830,680,947
7. Accrued Liabilities	(1,829,585)	(1,361,582)
8. Net Plan Assets (6 + 7)	**$865,086,080**	**$ 829,319,365**

Statement of Receipts and Disbursements of Plan Assets

	Year ending June 30, 2023	**Year ending June 30, 2022**
Market Value as of the beginning of the year	$829,319,364	$ 974,247,855
Receipts		
Contributions:		
Employer Basic Contributions	$27,416,800	$27,292,400
Employer (Restoration Plan)	64,308	20,618
Employees	5,021,889	4,620,918
Subtotal	$32,502,997	$31,933,936
Investment Income:		
Interest and Dividends	$17,196,877	$17,098,202
Investment Expenses	(2,026,667)	(1,559,779)
Capital Gain (Loss)	65,500,905	(120,364,081)
Net Investment Income	$80,671,115	($104,825,660)
Total Additions	$113,174,112	$(72,891,724)
Disbursements and Deferrals		
Benefit Payments and Refunds of Employee Contributions	$75,733,849	$71,267,466
Administrative Expenses	1,673,547	769,300
Total Disbursements	$77,407,396	$72,036,766
Market Value as of the end of the year	$865,086,080	$829,319,365
Adjustment for Accrued Liabilities	0	0
Adjusted Market Value	**$865,086,080**	**$829,319,365**

Development of Actuarial Value of Assets

The Actuarial Value of Assets equals the Market Value of Assets, adjusted for unrecognized gains and losses from prior years. Investment gains and losses are determined by calculating the expected asset return based on Plan assumptions and subtracting the actual Plan return. Each gain/loss is phased in 20% per year over a 5-year period. The Actuarial Value of Assets is adjusted, if necessary, to fall within a corridor of 80% to 120% of the Market Value of Assets on the valuation date.

	Year Ending 6/30/2023	**Year Ending 6/30/2022**
1. Market Value of Assets as of beginning of year Before adjustment for administrative expenses	$829,319,364	$974,247,855
2. Total Contributions for the year	32,502,997	31,933,936
3. Total Disbursements during the year	77,407,396	72,036,766
4. Expected Return	57,440,289	67,748,985
5. Actual Return for the year	80,671,115	(104,825,660)
6. Investment Gain/(Loss)	23,230,826	(172,574,645)
7. Gains/(Losses): Unrecognized Amounts:		
Current Year	$18,584,661	($138,059,716)
First Prior Year	(103,544,787)	109,791,283
Second Prior Year	73,194,189	(22,449,091)
Third Prior Year	(11,224,546)	(5,478,730)
Total Unrecognized Gains/(Losses)	($22,990,483)	($56,196,254)
8. Market Value of Assets as of end of year	$865,086,080	$829,319,365
9. Actuarial Value of Assets as of end of year: [(8) - (7)]	$888,076,563	885,515,619
10. Actuarial Value of Assets (AVA) with 80% - 120% Corridor Limitation Applied	**$888,076,563**	**$885,515,619**
Ratio of Actuarial Value to Market Value	102.7%	106.8%

1.2: Development of Unfunded Actuarial Accrued Liability

	June 30, 2023	June 30, 2022
1. Actuarial Accrued Liability (AAL)		
a. Active Participants		
(i) Retirement (Immediate Pension)	$231,257,456	$249,831,660
(ii) Vested Termination (Deferred to Normal Retirement)*	(176,424)	(862,474)
(iii) Death - Spouse's Benefit*	8,206,611	4,437,057
(iv) Disability*	2,865,949	2,287,165
(v) Total Active Participants	$242,153,592	$255,793,408
b. Retired and Disabled Participants Receiving Benefits	846,850,891	809,519,047
c. Terminated Participants with Deferred Benefits **	12,005,594	10,389,135
d. Refunds		
(i) Accumulated Employee Contributions Credited to Account of Terminated Participants and Beneficiaries of Deceased Participants who have not received a refund	690,156	777,675
(ii) Nonvested Participants on Leave of Absence or Military Leave	814	48,201
(iii) Total Refunds	$690,970	$825,876
e. Total Actuarial Accrued Liability	$1,101,701,047	$1,076,527,466
2. Actuarial Value of Assets	888,076,563	885,515,619
3. Funding Ratio (2 / 1e)	80.6%	82.3%
4. Unfunded Actuarial Accrued Liability (UAAL), (1e-2)	$213,624,484	$191,011,847

*Including liability for refund of employee contributions for Active Participants.
**Including liability for vested Participants on Leave of Absence or Military Leave. Nonvested Participants who are on a Leave of Absence or Military Leave are included with Refunds in line 1d(ii)

1.3: Development of Experience Gain/Loss

1.	Unfunded actuarial accrued liability as of June 30, 2022		$191,011,847
2.	Change due to contributions:		
	(a) Employer Normal Cost, beginning of year	7,745,407	
	(b) Prior Year ADEC, beginning of year	(25,596,030)	
	(c) Interest on (1) and (a) and (b)	12,121,286	
	(d) Net change [(a) + (b) + (c)]	(5,729,337)	
3.	Expected unfunded actuarial accrued liability as of June 30, 2023 [(1) + (2)]		$185,282,510
4.	Change since prior year:		
	(a) Non-investment experience (gain)/loss	20,410,954	
	(b) (Gain)/loss from assets/contributions	7,931,020	
	(c) Net change [(a) + (b)]	28,341,974	
5.	Unfunded actuarial accrued liability before changes [(3) + (4c)]		$213,624,484
6.	Change in actuarial assumptions		0
7.	Change in plan provisions		0
8.	Changes in actuarial methods		0
9.	**Unfunded actuarial accrued liability as of June 30, 2023** [(5) + (6) + (7) + (8)]		**$213,624,484**

1.4: Actuarially Determined Employer Contribution

		June 30, 2023	June 30, 2022
1. Total Normal Cost, with Expenses		$13,153,748	$13,208,402
As a percentage of payroll		8.40%	8.88%
2. Amortization of Unfunded Actuarial Accrued Liability		18,345,000	16,403,140
3. Expected Employee Contributions		(4,696,646)	(4,462,995)
4. Actuarially Determined Employer Contribution [sum of above]		$26,783,987	$25,148,547
5. Expected Payroll for the Year		156,554,864	148,686,933
6. Net Employer Cost as a % of Payroll [(4) / (5)]		17.12%	16.91%
7. Fixed WSSC Water Contribution Rate, % of Payroll		16.90%	16.90%
Equivalent Amortization Years Implied by Fixed Rate:			
	Level Dollar	22.1	21.3
	Level Percent of Payroll	15.7	15.0
	Fixed Contribution Adequate to cover Actuarial Cost:	NO	NO
	Estimated Additional Contribution to satisfy ADEC shown above:	$344,330	$18,765

The calculation above is based on WSSC Water's current Actuarial Funding Policy for the Retirement Plan. The amortization above is based on a level percentage of payroll over 15 years.

Maintaining the fixed rate implies that the unfunded AAL will be fully amortized over the next 19 years.

History of Equivalent Amortization Years

Valuation Year	Equivalent Years - Level Dollar	Equivalent Years - Level % of Payroll
2015	16.3	12.2
2016	14.2	11.0
2017	13.0	10.3
2018	12.4	9.9
2019	12.2	9.8
2020	18.7	13.3
2021	15.1	11.5
2022	21.3	15.0
2023	22.1	15.7

1.5: Present Value of Plan Benefits

	June 30, 2023	June 30, 2022
Number of Plan Participants		
Active Participants	1,611	1,600
Retired and Disabled Participants Receiving Benefits	1,711	1,705
Terminated Participants with Deferred Benefits or Refunds Due	161	139
Participants on Leave of Absence or Military Leave	12	13
Total Participants	3,608	3,457
Total Annual Earnings of Active Participants	$156,554,864	$ 151,190,586
Total Annual Benefits of Retired and Disabled Participants	77,839,749	73,624,954
Present Value of Plan Benefits (PVB)		
1. Active Participants		
a. Retirement (Immediate Pension)	$314,325,666	$ 336,383,432
b. Vested Termination (Pension Deferred to Normal Retirement)*	8,375,792	11,255,379
c. Death - Spouse's Benefit*	12,365,366	6,308,015
d. Disability*	6,771,513	5,451,132
e. Total Active PVB (a + b + c + d)	$341,838,327	$ 359,487,958
2. Retired and Disabled Participants Receiving Benefits	846,850,891	809,519,047
3. Terminated Participants with Deferred Benefits**	12,005,594	10,389,135
4. Refunds		
a. Accumulated Employee Contributions Credited to Account of Terminated Participants and Beneficiaries of Deceased Participants who have not received a refund	690,156	777,675
b. Nonvested Participants on Leave of Absence or Military Leave	814	48,201
c. Total Refunds (a + b)	$690,970	$ 825,876
Total Present Value of Benefits (1e + 2 + 3 + 4c)	$1,201,385,782	$ 1,180,222,016

*Including liability for refund of employee contributions for Active Participants.
**Including liability for vested Participants on Leave of Absence or Military Leave. Non-vested Participants who are on a Leave of Absence or Military Leave are included with Refunds in line 4.

1.6: Present Value of Accumulated Plan Benefits (PVAB)

	June 30, 2023	June 30, 2022
1. Actuarial present value of vested benefits (PVVB)		
a. Participants currently receiving payments (retired and disabled participants and beneficiaries)	$846,850,891	$809,519,047
b. Other participants		
i. Active participants	187,217,754	190,304,778
ii. Deferred vested participants/refunds	12,696,564	11,215,011
iii. Total	199,914,318	201,519,789
c. Total PVVB (a. + b.)	$1,046,765,209	$1,011,038,836
2. Actuarial present value of non-vested benefits	3,931,231	10,419,382
3. Total actuarial present value of accumulated plan benefits (PVAB) (1.c. + 2.)	$1,050,696,440	$1,021,458,218
4. Market value of assets	865,086,080	829,319,365
5. Ratio of Assets to PVAB (4. ÷ 3.)	82.3%	81.2%

The calculation of the actuarial present value of accumulated plan benefits is based on the unit credit cost method (which is based on no future service or salary increases) and the actuarial assumptions shown in Section 2.3.

1.7: Change in Present Value of Accumulated Plan Benefits

1. Actuarial present value of accumulated plan benefits (PVAB) as of July 1, 2022	$1,021,458,218
2. Change due to plan amendments	0
3. Change due to changes in assumptions and/or methods	0
4. Change due to passage of time	68,851,390
5. Change due to benefits paid	(75,733,849)
6. Change due to benefits accumulated and plan experience	36,120,681
7. Actuarial present value of accumulated plan benefits (PVAB) as of June 30, 2023: (1 + 2 + 3 + 4 + 5 + 6)	$1,050,696,440

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SECTION 2: BASIS OF VALUATION

2.1: Summary of Plan Provisions

The salient features of the retirement plan are presented below.

1. Effective date	May 1, 1967. The most recent amendment was adopted in April, 2019.
2. Closed version	Closed version means the retirement plan in effect on June 30, 1978. Membership in this version is mandatory for employees hired prior to July 1, 1978 who did not elect to transfer membership to the open version.
3. Participation	Each permanent full-time employee automatically becomes a participant on his hire date. A contract employee may be excluded by contractual agreement.
4. Gross compensation	Gross compensation is defined as total compensation paid to the employee by WSSC Water excluding merit bonuses, lump sum pay awards, and General Manager's awards, plus any amounts of compensation for which the employee has entered into a deferred compensation agreement and/or employer pick-up contributions. It does not include the employee's final pay period unless he receives compensation for the full pay period.
5. Final average monthly compensation	Final average monthly compensation is defined as an amount equal to the participant's gross compensation during each of the three years prior to termination which were the highest (to include 78 pay periods), divided by 36 months.
6. Credited service	Credited service means the years and fractional years (measured to the nearest month) of an employee's latest period of continuous service but excludes periods of non-military leaves of absence without pay which are not otherwise purchased. Additional "purchased" years of WSSC Water service, military service, prior agency service and authorized leave(s) of absence are added. Credited service includes accumulated unused sick leave that counts at the rate of .000481 year's credited service for each hour of unused sick leave. For purposes of computing benefits, credited service, excluding credit for unused sick leave, is limited to a maximum of 36 years.

7. Closed version credited service	Closed version credited service means all credited service earned by an employee hired prior to July 1, 1978 until the date he transfers his membership to the open version. Also included is purchased service if the employee is a member at the time of purchase.
8. Open version credited service	Open version credited service means all credited service earned by an employee hired after June 30, 1978. Any employee hired prior to July 1, 1978 who transfers his membership to the open version shall have all credited service earned after his transfer counted as open version credited service. Also included is purchased service if the employee is a member at the time of purchase.
9. Employee contributions	Mandatory: Each participant in the closed version is required to contribute 6% of his gross compensation with respect to each pay period. Each participant in the open version is required to contribute 3% of his gross compensation with respect to each pay period. All contributions are credited with 5% interest per annum.
10. Normal retirement	Eligibility: A participant in the closed version is eligible to retire upon the earlier of (i) attainment of age 60 and completion of one-year credited service and (ii) the completion of 30 years of credited service. A participant in the open version hired before March 31, 1994 is eligible to retire upon the earlier of (i) attainment of age 62 and completion of three years credited service, and (ii) the date on which he has completed at least 30 years credited service and the sum of his credited service and attained age total at least 85. A participant in the open version hired after March 31, 1994 is eligible to retire upon the earlier of (i) attainment of 65 and completion of five years credited service, and (ii) the date on which he has completed at least 30 years credited service and the sum of his credited service and attained age total at least 85. Monthly benefit amount: 2.1% x final average monthly compensation x closed version credited service plus 1.4% x final average monthly compensation x open version credited service.

11. Early retirement

Any employee in the closed version may retire early provided he has completed 15 or more years of credited service and has attained age 45, and further provided that the sum of his age and credited service at termination total at least 65.

Any employee in the open version may retire early provided he has completed 15 or more years of credited service and has attained age 50.

Monthly benefit amount: The annual monthly benefit is determined in accordance with the normal retirement formula but using final average monthly compensation and credited service at the time of termination. This benefit is reduced to reflect early commencement. The percentage payable is as follows (provided, however, that the Open Version reductions for years 13, 14 and 15 shall be effective only with respect to Employees hired on and after January 21, 2009):

	Percentage of Benefit Payable	
Years Early	Closed Version	Open Version
1	98%	95%
2	95%	90%
3	91%	85%
4	86%	80%
5	80%	75%
6	74%	70%
7	68%	65%
8	62%	60%
9	56%	55%
10	50%	50%
11	44%	45%
12	38%	40%
13	32%	35%
14	26%	30%
15	20%	25%

If a participant defers the commencement of benefits, his benefit will be adjusted by any cost-of-living increases that were effective during the deferral period.

12. Temporary supplemental benefit	Any participant in the Open Version whose benefit commencement date is prior to age 62 shall receive a benefit equal to 0.6% of his final average monthly compensation at termination multiplied by his Open Version credited service at termination, reduced to reflect early commencement if applicable. The percentage of benefit payable is determined in accordance with the percentages in the previous table. The benefit is payable through the month in which he attains age 62 or dies, if earlier.
13. Disability retirement	Eligibility: A participant is eligible for a disability benefit if he has one year of credited service and is found by the Social Security Administration to be disabled under its criteria for a period of at least 24 months. Monthly benefit amount: The disability benefit is determined under the normal retirement formula using credited service and final average monthly compensation at the time of termination. This benefit is subject to a minimum of 35% of final average monthly compensation, or 50% of final average monthly compensation if disabled as a result of a job-related accident.
14. Deferred vested retirement	Eligibility: Any participant of the plan who terminates after completing five years of credited service is eligible for a deferred vested benefit beginning on his normal retirement date. Monthly benefit amount: The deferred vested benefit is determined using the normal retirement formula based on final average monthly compensation and credited service at the time of termination. In lieu of this benefit the participant may elect a withdrawal benefit and thereby forfeit his deferred vested benefit.
15. Withdrawal benefit	Eligibility: Each participant, who terminates before becoming eligible for a normal, early, disability or deferred retirement benefit, automatically receives a withdrawal benefit. Any participant eligible for a normal, early, disability or deferred vested retirement benefit, which will not commence within one month of termination, may elect a withdrawal benefit. Amount: The withdrawal benefit shall be the sum of all contributions made by the employee which have not been withdrawn previously, plus credited interest.
16. Pre-retirement death	If any employee completes at least 15 years of Credited Service, the spouse if named as beneficiary will receive a spousal benefit equal to the benefit payable had the participant retired on a joint and 100% survivor option on the day before death. Alternatively, the spouse may elect a refund of contributions and interest. If not married at date of death, the sum of all contributions made by the employee plus credited interest will be paid to the employee's designated beneficiaries.

17. Consumer Price Index increase

All benefits payable to pensioners and beneficiaries retired under the Closed Version shall be increased following two months during which the Consumer Price Index is at least 3% higher than the Consumer Price Index of the base month.

All benefits payable to pensioners and beneficiaries retired under the Open Version shall be increased each March 1 following retirement in accordance with increases in the Consumer Price Index from the prior calendar year. In the event the participant retired during the preceding calendar year, a pro rata increase to reflect the partial year during which he was retired will be provided.

18. Normal and optional forms of payment

Pensions are normally payable for the life of the participant; however, a participant may elect to receive any other form of benefit provided under the plan which is actuarially equivalent in value. The following optional forms of payment are available under the plan:

- A reduced pension which is payable during the lifetime of the pensioner and continues to the surviving spouse at a rate equal to 100%, 75%, 66-2/3% or 50% of the reduced initial pension.
- A reduced pension which is payable as long as both the pensioner and the spouse are surviving. In addition, if the spouse survives the pensioner, a lifetime pension will continue to the spouse at a rate equal to 100%, 75%, 66-2/3% or 50% of the reduced initial pension. However, if the pensioner survives the spouse, the lifetime benefit will be increased to the original standard form of pension.
- A reduced pension to the participant during his lifetime with benefit payments guaranteed for at least 120 months or 180 months.

If a participant marries following his Benefit Commencement Date, the Participant may revoke any existing election and in its place elect a joint and contingent survivor option, provided such election is made within one year of the date of marriage and the Participant names his spouse as contingent annuitant.

A pensioner who elects a joint and contingent survivor option and subsequently divorces may revoke the existing election. After such revocation, a lifetime pension will continue to the pensioner at a rate equal to the unreduced initial pension.

There have been no changes in Plan provisions since the prior valuation.

2.2: Demographic Information

Participant Summary

	June 30, 2023	June 30, 2022
1. Closed Plan Active Participants		
a. Number	3	4
b. Average Age	71.72	71.24
c. Average Years of Service	48.30	47.18
d. Total Pay	$396,560	$557,115
e. Average Pay	132,187	139,279
2. Open Plan Active Participants		
a. Number	1,608	1,596
b. Average Age	47.97	47.68
c. Average Years of Service	11.60	11.70
d. Total Pay	$ 152,391,620	$ 145,044,784
e. Average Pay	94,771	90,880
3. All Active Participants		
a. Number	1,611	1,600
b. Average Age	48.02	47.74
c. Average Years of Service	11.67	11.79
d. Total Pay	$ 152,788,180	$ 145,601,899
e. Average Pay	94,841	91,001
4. Retired Participants and Beneficiaries		
a. Number	1,667	1,665
b. Average Age	71.86	71.51
c. Total Annual Pension	$ 76,851,097	$ 72,757,326
d. Average Annual Pension	46,101	43,698
5. Disabled Participants		
a. Number	42	40
b. Average Age	67.40	66.86
c. Total Annual Pension	$ 988,652	$ 867,628
d. Average Annual Pension	23,539	21,691
6. Deferred Vested Participants		
a. Number	172 *	148 *
b. Average Age	51.20	51.39
c. Total Annual Pension	$ 1,898,708	$ 1,590,137
d. Average Annual Pension	11,039	10,744

*Including vested Participants on Leave of Absence or Military Leave (9 for 2022 and 6 for 2023). Non-vested Participants who are on a Leave of Absence or Military Leave are not shown above (4 for 2022 and 1 for 2023).

Reconciliation of Closed Plan Participants

	Active	Inactive	Retired and Beneficiaries	Deferred Vested	Disabled	Total
Census June 30, 2022	4	0	680	0	4	688
Retired	-1		1			0
Disabled						0
Died:						
With Beneficiary			-8			-8
Without Beneficiary			-24			-24
Refund Paid to Beneficiary						0
Refund Payable to Beneficiary						0
DRO stopped						0
Beneficiaries Added			8			8
Alternate Payees Added						0
Terminated						
Vested						0
Non-vested: Refund Paid						0
Non-vested: Refund Payable						0
Vested and Paid Employee Contributions						0
Added						0
Went on Leave						0
Returned from Leave						0
Reinstated						0
Adjustments*			-2			-2
Census as of June 30, 2023	3	0	655	0	4	662

*Combined additional records for two payees.

Reconciliation of Open Plan Participants

	Active*	Inactive	Retired and Beneficiaries	Deferred Vested	Disabled	Total
Census June 30, 2022	1,596	13	985	139	36	2,769
Retired	-41		44	-3		0
Disabled	-1				1	0
Died:						
With Beneficiary			-8		-1	-9
Without Beneficiary			-16			-16
Refund Paid to Beneficiary						0
Refund Payable to Beneficiary						0
DRO Stopped						0
Beneficiaries Added			9			9
Alternate Payees Added						0
Terminated						
Vested	-33	-3		36		0
Non-vested: Refund Paid	-24	-2				-26
Non-vested: Refund Payable	-52	-2				-54
Vested and Paid Employee Contributions	-8			-4		-12
Added	169					169
Went on Leave	-5	5				0
Returned from Leave	4	-4				0
Reinstated	3		-1	-2		0
Adjustments**			-1		2	1
Census as of June 30, 2023	1,608	7	1,012	166	38	2,831

*Those with retiree payments stopped while reemployed are included in the active count.

** Changed record for beneficiary who was falsely determined to be deceased in prior valuation.

Active Participant Age/Service Distribution

Age Group	SERVICE LEVEL 0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
MALE										
0 - 19	1									1
20 - 24	18	1								19
25 - 29	60	14	1							75
30 - 34	65	42	7	1						115
35 - 39	43	45	25	8						121
40 – 44	29	46	48	28	4	1				156
45 - 49	29	36	31	23	3	16	1			139
50 - 54	32	39	30	28	17	22	13			181
55 - 59	26	27	33	24	5	16	14	3		148
60 - 64	16	19	29	13	6	12	14	11	1	121
65 - 69	7	8	13	6	3	6	6	13	2	64
70+	0	3	2	4	2	1	2	0	2	16
Total	326	280	219	135	40	74	50	27	5	1,156
FEMALE										
0 – 19										0
20 - 24										0
25 - 29	9	1								10
30 - 34	22	7	1							30
35 - 39	30	11	9							50
40 – 44	20	17	14	6	2					59
45 - 49	19	20	8	6	3	3				59
50 - 54	11	16	12	13	3	5	6			66
55 - 59	8	15	9	11	5	9	5	8		70
60 - 64	11	10	6	11	7	10	5	8		68
65 - 69	1	5	4	3		3	5	7	4	32
70+	1	2	1	3		1	1	2		11
Total	132	104	64	53	20	31	22	25	4	455

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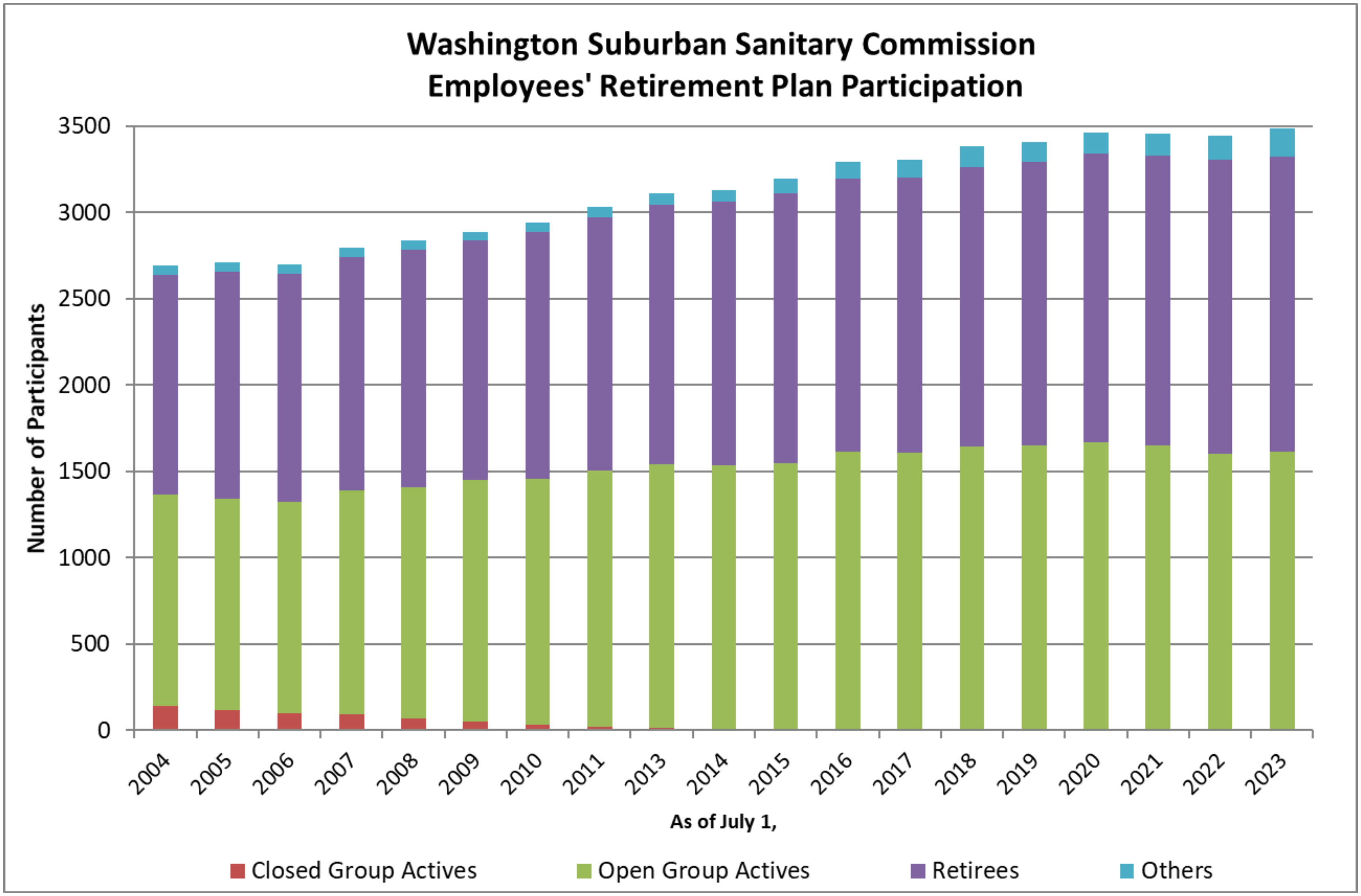

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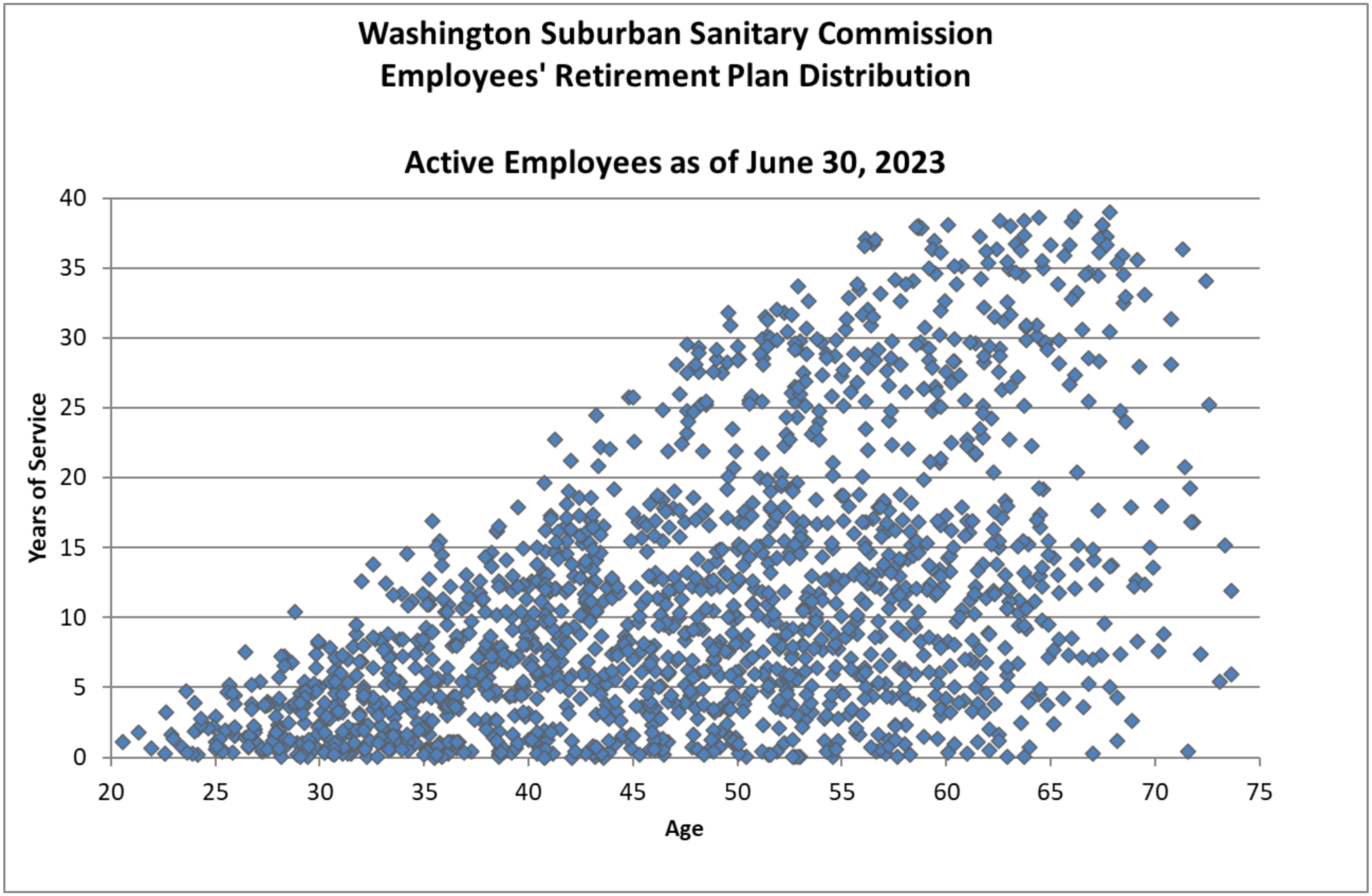

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2.3: Actuarial Assumptions and Methods

The funding methods and assumptions are used in determining the actuarial costs and liabilities presented in this Report. The assumptions were developed from the actuarial assumption review and experience study prepared in 2021, covering Plan experience from July 1, 2015 through June 30, 2020. The next study and assumption review will cover 2020 through 2025. The combined impact of all assumptions is not expected to produce any significant bias.

1. Employee data — The employee data used in the determination of cost estimates consist of pertinent information with respect to active participants and pensioners of the Washington Suburban Sanitary Commission Employee's Retirement Plan.

2. Valuation date — June 30, 2023

3. Actuarial funding method — The Entry Age Normal Cost Method is used. The contributions equal the Normal Cost plus an amount to amortize the Unfunded Actuarial Accrued Liability over a period no longer than 30 years. Beginning with the June 30, 2018 valuation, a 20-year amortization period is used for the purpose of comparing the actuarial cost to WSSC Water's contribution rate.

   The Normal Cost is the level annual payment that would be required to fund the Plan if paid from the date each employee became eligible to participate to the date of exit. The Actuarial Accrued Liability is the accumulated value of the Normal Cost for each employee from date of participation to the present. The Unfunded Actuarial Accrued Liability is the Actuarial Accrued Liability minus the Actuarial Value of Assets. Actuarial gains and losses reduce or increase the Unfunded Actuarial Accrued Liability.

4. Valuation of assets — The Average Value Method is used to determine the Actuarial Value of Assets. This method determines the value of assets so that asset appreciation or depreciation is only partially recognized in the year of occurrence. The result is a gradual recognition of 20% per year over a 5-year period of each year's appreciation or depreciation in excess of or less than that which was assumed. The Actuarial Value of Assets must be within 80% to 120% of the Market Value of Assets.

5. Rate of investment return — A rate of 7.00% per year, net of investment expenses, is assumed as the annual investment return for the trust.

6. Cost-of-living — An annual retiree cost-of-living increase of 2.50% is assumed.

7. Expenses — Administrative expenses are assumed to be $1,000,000 per year (added to the Normal Cost).

8. Salary Increases

The total pay increase assumption, including wage growth and career increases, is:

Years of Service	Increase
Less than 5	7.50%
5+	2.75%

9. Mortality tables for employees and annuitants

For non-disability annuitant mortality, the Pub2010G(B) mortality tables (Employees rates up to age 49, and Healthy Retiree rates thereafter) projected with Scale SSA (2023 intermediate long-term) generationally. Mortality for pre-retirement deaths is 50% of the annuitant mortality for males and females.

For disability retirement pension mortality, the Pub2010G Disabled Retiree tables, projected with Scale SSA generationally (2023 long-term intermediate).

A 109% factor is applied to female rates in each case.

10. Rates of age retirement

Age	Rate
50-54	7.0%
55-60	11.0%
61-64	7.0%
65-69	20.0%
70+	100%

11. Withdrawal Rates

Years of Service	Male	Female
0	11.0%	13.8%
1	9.4%	11.7%
2	7.9%	9.9%
3	6.8%	8.4%
4	5.7%	7.2%
5	4.9%	6.1%
6	4.1%	5.2%
7	3.5%	4.4%
8	3.0%	3.7%
9	2.5%	3.2%
10	2.2%	2.7%
11	1.8%	2.3%
12	1.6%	2.0%
13	1.3%	1.7%
14	1.1%	1.4%
15+	1.0%	1.2%

As shown above, female rates are equal to 125% of male rates.

12. Disability rates

The assumed rates of disability are illustrated by the following table:

Age	Rate	Age	Rate
40	0.01%	53	0.14%
41	0.02%	54	0.15%
42	0.03%	55	0.16%
43	0.04%	56	0.17%
44	0.05%	57	0.18%
45	0.06%	58	0.19%
46	0.07%	59	0.20%
47	0.08%	60	0.21%
48	0.09%	61	0.22%
49	0.10%	62	0.23%
50	0.11%	63	0.24%
51	0.12%	64	0.25%
52	0.13%	65+	0.00%

13. Marital status

It is assumed that 70% of the participants are married. Male (female) participants are assumed to have a female (male) spouse three years younger.

There have been no changes in methods and assumptions since the prior valuation, except the update of the mortality projection scale.

SECTION 3: PROJECTIONS OF PLAN FUNDING

3.1: Projection of Cash Flows

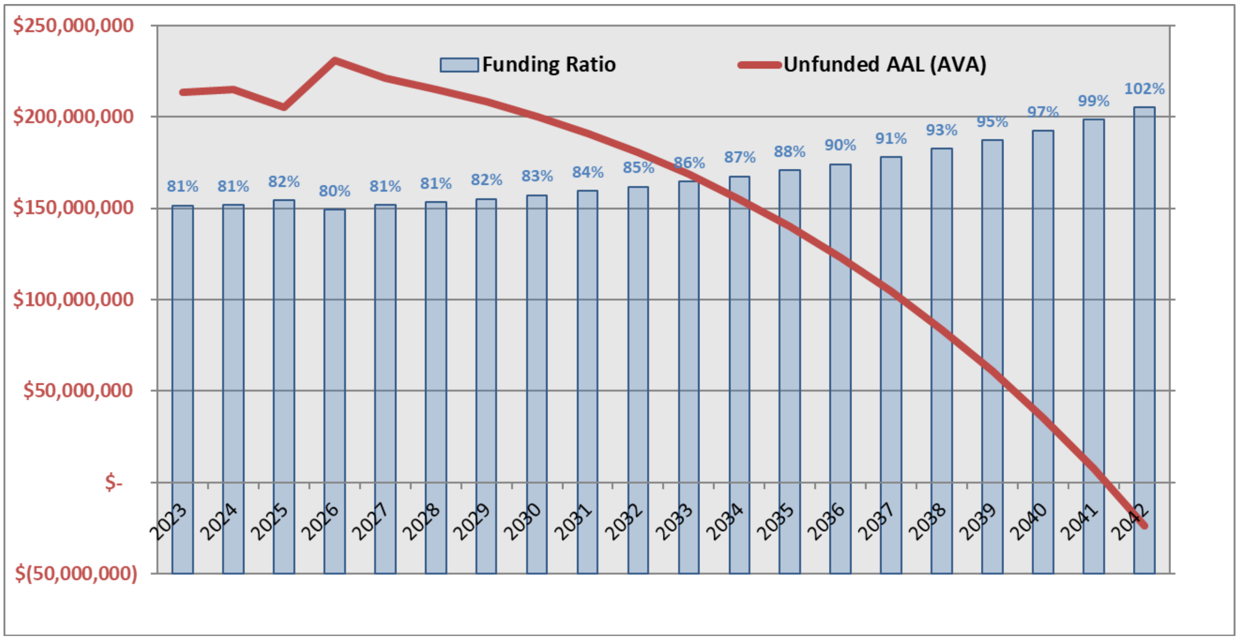
Year	MVA BOY	AVA BOY	WSSC Contrib	EE Contrib	Disbursements	Investment Income	Net Increase
2023	$ 865,086,080	$ 888,076,563	$ 26,457,772	$ 4,696,646	$ 76,332,047	$ 59,001,552	$ 13,823,923
2024	878,910,003	897,404,271	27,185,361	4,825,804	77,858,688	59,946,177	14,098,653
2025	893,008,656	918,231,255	27,932,958	4,958,513	79,415,862	60,909,793	14,385,402
2026	907,394,058	902,747,893	28,701,115	5,094,872	81,004,179	61,893,243	14,685,051
2027	922,079,109	922,079,109	29,490,395	5,234,981	82,624,262	62,897,431	14,998,545
2028	937,077,654	937,077,654	30,301,381	5,378,943	84,276,748	63,923,328	15,326,905
2029	952,404,559	952,404,559	31,134,669	5,526,864	85,962,283	64,971,977	15,671,227
2030	968,075,786	968,075,786	31,990,872	5,678,853	87,681,528	66,044,497	16,032,694
2031	984,108,480	984,108,480	32,870,621	5,835,022	89,435,159	67,142,090	16,412,574
2032	1,000,521,054	1,000,521,054	33,774,563	5,995,485	91,223,862	68,266,049	16,812,235
2033	1,017,333,289	1,017,333,289	34,703,364	6,160,360	93,048,339	69,417,760	17,233,145
2034	1,034,566,434	1,034,566,434	35,657,706	6,329,770	94,909,306	70,598,714	17,676,885
2035	1,052,243,318	1,052,243,318	36,638,293	6,503,839	96,807,492	71,810,512	18,145,153
2036	1,070,388,471	1,070,388,471	37,645,846	6,682,695	98,743,642	73,054,876	18,639,775
2037	1,089,028,246	1,089,028,246	38,681,107	6,866,469	100,718,515	74,333,653	19,162,714

*Assuming 7.00% returns each year, and
3.00% increases in total payroll

MVA = Market Value of Assets

AVA = Actuarial Value of Assets

3.2: Projection of Funding Progress



The projection above is based on no experience gains or losses over the next two decades. Notably, investment returns are expected to be exactly 7.0% per year. While this exact scenario is impossible, it does provide an assessment of the employer's funding policy. Given no significant experience losses, the policy is expected to maintain a funding level near the current level and lead to 100% funding over this time frame.

RISK ASSESSMENT

There are a number of risks inherent in managing a pension plan/trust. Some of the most substantial risks are (not an all-inclusive list):

- Investment Return Risk: Future investment returns may be unfavorable compared to what is assumed for Plan funding purposes.
- Investment Volatility Risk: Investment returns will vary from year to year and over time, with a possible single or multiple year significant drop in plan assets. This impacts contribution amounts as well as compound returns.
- Longevity Risk: Plan members and beneficiaries may live longer than projected, and thus be entitled to additional years of benefit payments versus what had been expected.
- Other Demographic Risks: Future demographic experience may be unfavorable compared to expected rates of retirement, termination, and disability. Future salary increases may also be higher than expected, thereby increasing the liability of pay-related benefits.

The following examples quantify several of these risks. In the first table, we can see that a lower investment return would have a significant impact on funding and plan costs. All other assumptions and methods are the same for each column.

1. **Investment Return Risk**

($ mm)	Current Return Assumption (7.00%)	6.00% Return Assumption	3.75% Return Assumption
Actuarial Liability	$1,101.5	$1,218.4	$1,573.7
Plan Assets	888.1	888.1	888.1
Unfunded Liability	$213.4	$330.3	$685.6
Funding Ratio	81%	73%	56%
Actuarially Determined Employer Contribution	$26.8	$38.3	$70.8
% of Payroll	17.1%	24.5%	45.2%

The actuarial liability in the right column can be considered a low default-risk obligation measure, as defined in Actuarial Standard of Practice (ASOP) 4. The discount rate shown above is the rate that would be required for an unfunded plan (no plan assets) under GASB 68, and is therefore based on expected returns on municipal bonds (i.e., the plan sponsor's estimated borrowing cost), which results in a higher actuarial liability. This discount rate would be appropriate if the fund was invested only in high quality fixed income securities. As shown in the table above, this would also entail a significantly greater shortfall in funding and accompanying higher annual contributions.

The difference between the Actuarial Accrued Liability figures in the left and right columns can also be thought of as representing the expected savings from investing in a diversified portfolio compared to investing only in fixed income securities; however, this expected savings is not guaranteed. The Plan has a significant amount of assets to provide a high level of benefit security, with about 11 years of expected benefit payments covered by current assets.

The next table illustrates the impact of plan participants living longer than expected. In general, each 10% lower rate of mortality entails one additional year of life expectancy. The right column below indicates that if all participants lived two years longer than expected, then the cost of the Plan would be about 4% of payroll higher.

2. Longevity Risk

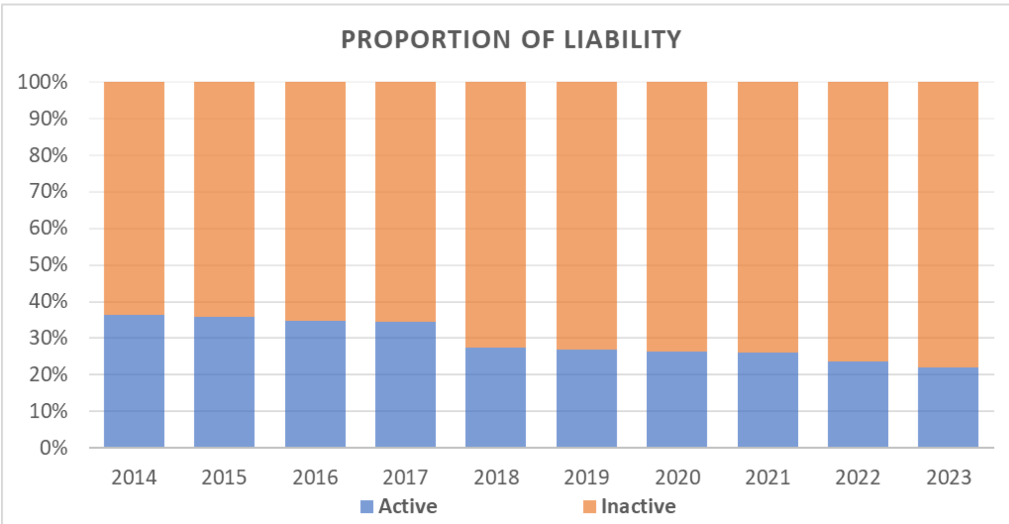
($ mm)	Current Mortality Assumption	20% Lower Mortality Rates
Actuarial Liability	$1,101.5	$1,167.5
Plan Assets	888.1	888.1
Unfunded Liability	$213.4	$279.4
Funding Ratio	81%	76%
Actuarially Determined Employer Contribution	$26.8	$33.0
% of Payroll	17.1%	21.1%

Plan Maturity

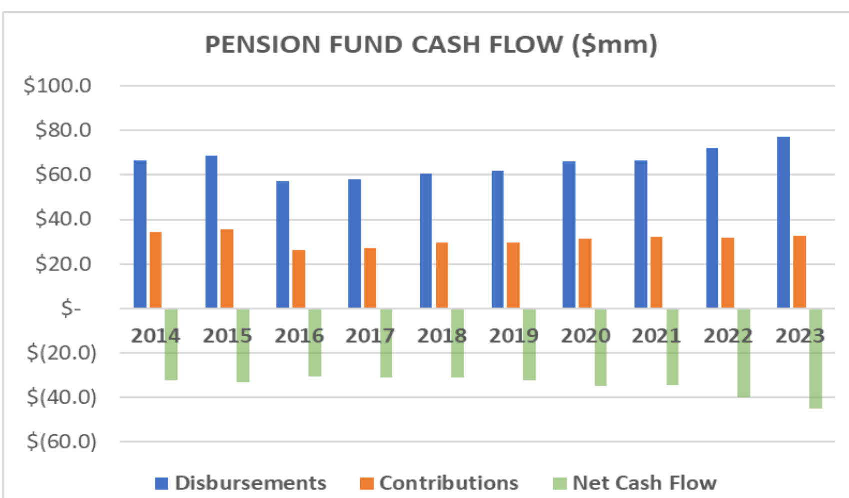
Another challenging risk faced by many pension plans is the maturing of the plan over time. This can be seen in the number of inactive (retirees, beneficiaries, etc.) versus the number of active employees in the plan population, as well as the liability of each group. As the plan matures risks emerge, including:

- Higher ratio of assets to payroll, which leads to a greater degree of contribution rate volatility.
- Negative cash flow (disbursements exceeding contributions), which exacerbates the impact of an economic downturn.
- Greater degree of longevity risk (as illustrated above).

The following graphs illustrate some of these plan maturity measures in recent years, showing how the plan is maturing over time. Over the past decade, the percentage of participants has remained fairly consistent and is about 55% inactive (by headcount) as of June 30, 2023. However, as shown in the graph below, the Plan liability has increased from about 65% inactive in 2013 to 78% in 2023, indicating continued maturing/aging.



The fund has experienced negative cash flow (disbursements greater than contributions) of approximately $35 million per year over the last decade, in increasing amounts. This is another indication of a very mature plan. As the Plan's funding approaches 100% and the fixed employer contribution rate is higher than the actuarial rate, investment returns are expected to finance benefit payments.



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