WASHINGTON SUBURBAN SANITARY COMMISSION EMPLOYEES' RETIREMENT PLAN

ACTUARIAL VALUATION
AS OF
JUNE 30, 2021

April 2022

CONTENTS

BOOMERSHINE CONSULTING GROUP, LLC
ACTUARIAL & RETIREMENT PLAN SOLUTIONS

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, 2021. 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.

It is our understanding that WSSC Water currently maintains a 16.9% of covered payroll employer contributions to the Plan. This rate continues to be adequate to finance Plan benefits and lead to improved funding. The funding ratio is now 84.5% (AVA basis), and is expected to improve going forward, given continued contributions at the 16.9% rate, 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 94.7%.

Plan experience since the prior valuation includes the following:

<u>Favorable Experience</u>

- *Cost-of-Living Adjustments – Open Plan.* Benefits increased 1.36% effective March 1, 2021 for non-active participants in the open group. This is less than the assumed 2.50% cost-of-living increase for the open group.

- *Mortality.* There were 60 deaths among retirees including disabled retirees and beneficiaries, for the plan year, compared to 51 expected. There were 22 new beneficiaries associated with these deaths.

- *Retirements.* The number of active participants who retired during the plan year totaled 45, compared to the expected 58 retirements.

- *Compensation.* This year's total payroll for continuing actives increased by 1.96% over the prior valuation, which is less than assumed.

- *Investment Return* On a market-value basis, the Plan's return was 31.25% for the year ended June 30, 2021, compared to the assumed rate of 7.00%.

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

<u>Unfavorable Experience</u>

- *Cost –of-Living Adjustments – Closed Plan.* Benefits increased 4.66% effective July 1, 2021 for non-active participants in the closed group, which is greater than the assumed 2.50% cost-of-living increase.

- *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 53, which is fewer than the expected 63 terminations.

The experience losses from above increased the actuarial cost and liability of the Plan.

The net impact of the experience gains and losses for the prior Plan year is a decrease in actuarial cost as a percentage of payroll.

New Entrants. The number of active participants decreased by 1.20% from 1,671 as of June 30, 2020 to 1,651 as of June 30, 2021.

Section 2 describes the basis of the valuation. That section summarizes the plan provisions, as well as the actuarial assumptions and methods used to develop the figures herein.

To the best of our knowledge, the information contained in this report is complete and accurate. The undersigned are available to provide further information and answer any questions with respect to this report.

The first two undersigned are members of the American Academy of Actuaries, and meet the qualification standards required to render the actuarial opinions presented herein.

Gregory M. Stump, FSA, EA, MAAA, FCA
Chief Actuary

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Darlene A. Morgan, CEBS
Senior Consultant

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.

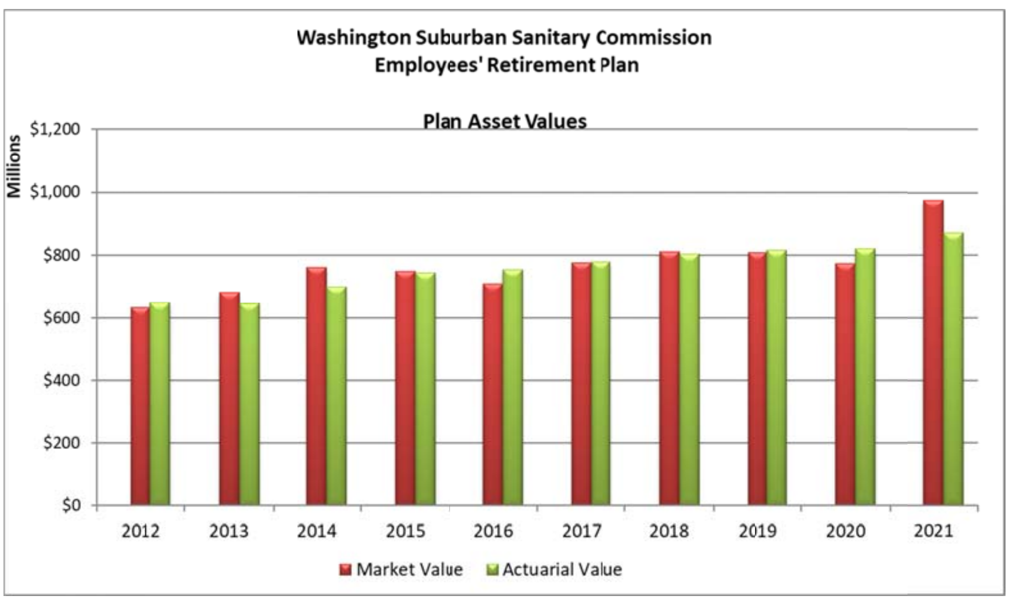
Historical Values

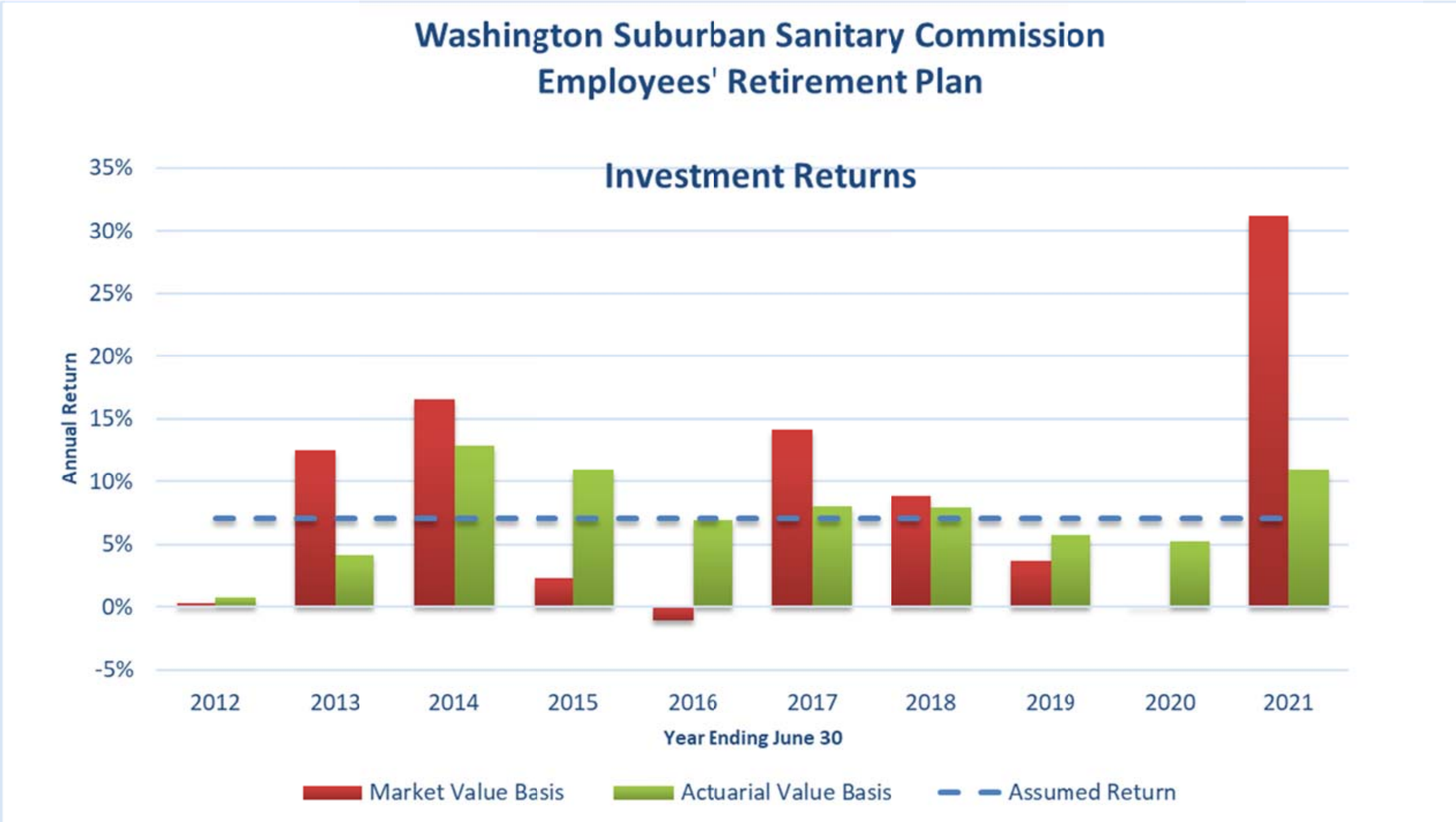
The following table shows the most recent five years of market values as well as smoothed asset values, and the accompanying annual returns.

Year Ending	Market Value		Actuarial Value	
June 30	Value	Annual Return	Value	Annual Return
2017	$ 775,046,158	14.12%	$777,857,053	7.97%
2018	810,937,596	8.79%	804,356,892	7.89%
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%
Five Year Compound Return		11.09%		7.56%

As expected, some years the Adjusted Value is greater than the Market Value, and some years it is less. Therefore, the smoothing method has had the intended effect.

Included in the remainder of this section are: the reconciliation of the market value of assets from June 30, 2020 to June 30, 2021; development of the actuarial value of assets; a comparative summary of assets; and summary of historical returns and experience.





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Earnings Experience for Fund on Plan Year Basis

	Plan Year Ending			
	6/30/2018	**6/30/2019**	**6/30/2020**	**6/30/2021**
Market Basis				
Net Investment Income*	$ 13,395,239	$ 13,595,076	$ 19,880,955	$ 20,836,736
Capital Gains (Losses)	53,396,826	15,535,021	(19,751,831)	215,321,418
Total Income	$ 66,792,065	$ 29,130,097	$ 129,124	$236,158,154
Average Mean Market Value of Assets**	$ 759,595,845	$ 794,741,591	$ 790,357,462	$ 755,818,240
Rate of Return*				
Net Investment Income	1.76%	1.71%	2.52%	2.75%
Capital Gains (Losses)	7.03%	1.95%	-2.50%	28.49%
Total Investment Return	8.79%	3.67%	0.02%	31.25%

* 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.

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Annual Compounded Market Value Rate of Investment Return

	Period Ending on June 30									
Period Beginning July 1	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
2011	0.33%	6.23%	9.58%	7.71%	5.89%	7.23%	7.44%	6.96%	6.17%	8.44%
2012		12.47%	14.49%	10.29%	7.32%	8.65%	8.67%	7.95%	6.92%	9.38%
2013			16.56%	9.21%	5.66%	7.71%	7.94%	7.21%	6.15%	9.00%
2014				2.33%	0.60%	4.92%	5.87%	5.43%	4.52%	7.96%
2015					-1.11%	6.26%	7.09%	6.22%	4.95%	8.93%
2016						14.12%	11.43%	8.79%	6.52%	11.06%
2017							8.79%	6.23%	4.11%	10.31%
2018								3.67%	1.83%	10.83%
2019									0.02%	14.57%
2020										31.25%

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Statement of Plan Assets (Market Value Basis)

	June 30, 2021	June 30, 2020
1. Cash	$0	$0
2. Investment*	975,207,069	773,467,370
3. Subtotal (1 + 2)	$ 975,207,069	$ 773,467,370
4. Accrued Contributions		
a. Employer	0	0
b. Employee	278,584	309,715
c. Total	278,584	309,715
5. Accrued Income	574,753	632,880
6. Total Assets (3 + 4c + 5)	$ 976,060,406	$ 774,409,965
7. Accrued Liabilities	(1,434,137)	(1,241,601)
8. Net Plan Assets (6 + 7)	$ 974,626,269	$ 773,168,364

*Has been adjusted for administrative expenses payable of $750,044.

Statement of Receipts and Disbursements of Plan Assets

	Year ending June 30, 2021	Year ending June 30, 2020
Market Value as of the beginning of the year	$ 773,168,364	$ 807,675,683
Receipts		
Contributions:		
Employer Basic Contributions	$ 27,281,954	$ 26,450,000
Employer (Restoration Plan)	50,000	30,798
Employees	4,733,960	5,032,801
Subtotal	$ 32,065,914	$ 31,513,599
Investment Income:		
Interest and Dividends	$ 23,729,354	$ 22,116,372
Investment Expenses	(2,892,618)	(2,235,417)
Capital Gain (Loss)	215,321,418	(19,751,831
Net Investment Income	$ 236,158,154	$ 129,124
Total Additions	$ 268,224,068	$ 31,642,723
Disbursements and Deferrals		
Benefit Payments and Refunds of Employee Contributions	$ 66,016,120	$ 66,150,042
Administrative Expenses	750,044	0
Total Disbursements	$ 66,766,164	$ 66,150,042
Market Value as of the end of the year	$ 974,626,269	$ 773,168,364

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 6/30/2021	**Year Ending 6/30/2020**
1. Market Value of Assets as of beginning of year Before adjustment for administrative expenses	$773,168,364	$807,675,683
2. Total Contributions for the year	32,065,914	31,513,599
3. Total Disbursements during the year	66,766,164	66,150,042
4. Expected Return	53,172,683	56,251,851
5. Actual Return for the year	236,158,154	129,124
6. Investment Gain/(Loss)	182,985,471	(56,122,727)
7. Gains/(Losses): Unrecognized Amounts:		
Current Year	146,388,377	(44,898,182)
First Prior Year	(33,673,636)	(16,436,190)
Second Prior Year	(10,957,460)	5,108,415
Third Prior Year	2,554,208	9,704,461
Total Unrecognized Gains/(Losses)	$ 104,311,489	($46,521,496)
8. Market Value of Assets as of end of year	$974,626,269	$773,168,364
9. Actuarial Value of Assets as of end of year: [(8) - (7)]	870,314,780	819,689,860
10. Final Actuarial Value of Assets (AVA) with 80% - 120% Corridor Limitation Applied	$870,314,780	$819,689,860
Ratio of Actuarial Value to Market Value	89.3%	106.0%

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1.2: Development of Unfunded Actuarial Accrued Liability

	June 30, 2021	June 30, 2020
1. Actuarial Accrued Liability (AAL)		
a. Active Participants		
(i) Retirement (Immediate Pension)	$262,227,402	$262,066,069
(ii) Vested Termination (Deferred to Normal Retirement)*	(764,450)	(838,803)
(iii) Death - Spouse's Benefit*	4,811,486	2,231,335
(iv) Disability*	2,535,578	2,621,457
(v) Total Active Participants	$268,810,016	$266,080,058
b. Retired and Disabled Participants Receiving Benefits	749,723,985	735,055,379
c. Terminated Participants with Deferred Benefits **	10,381,816	9,888,456
d. Refunds		
(i) Accumulated Employee Contributions Credited to Account of Terminated Participants and Beneficiaries of Deceased Participants who have not received a refund	$445,415	$445,301
(ii) Nonvested Participants on Leave of Absence or Military Leave	17,408	5,962
(iii) Total Refunds	$472,823	$451,263
e. Total Actuarial Accrued Liability	$1,029,388,640	$1,011,475,156
2. Actuarial Value of Assets	870,314,780	819,689,860
3. Funding Ratio (2 / 1e)	84.5%	81.0%
4. Unfunded Actuarial Accrued Liability (UAAL) (1e - 2)	$159,073,860	$191,785,296

*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: Actuarially Determined Employer Contribution

	June 30, 2021	June 30, 2020
1. Total Normal Cost, with Expenses	$13,781,174	$13,968,577
As a percentage of payroll	8.81%	8.84%
2. 20-Year Amortization of Unfunded Actuarial Accrued Liability	14,033,128	16,918,855
3. Expected Employee Contributions	4,702,199	4,747,176
4. Actuarially Determined Employer Contribution [(1) + (2) - (3)]	$23,112,103	$26,140,256
5. Expected Payroll for the Year	156,507,410	158,006,887
6. Net Employer Cost as a % of Payroll [(4) / (5)]	14.77%	16.54%
7. Fixed WSSC Water Contribution Rate, % of Payroll	16.90%	16.90%
Equivalent Amortization Years Implied by Fixed Rate:		
Level Dollar	15.1	18.7
Level Percent of Payroll	11.5	13.3
Fixed Contribution Adequate to cover Actuarial Cost:	YES	YES
Additional Contribution to satisfy ADEC:	N/A	N/A

The calculation above is based on WSSC Water's current Actuarial Funding Policy for the Retirement Plan.

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

1.4: Present Value of Plan Benefits

	June 30, 2021	June 30, 2020
Number of Plan Participants		
Active Participants	1,651	1,671
Retired and Disabled Participants Receiving Benefits	1,678	1,668
Terminated Participants with Deferred Benefits or Refunds Due	126	122
Participants on Leave of Absence or Military Leave	14	7
Total Participants	3,469	3,468
Total Annual Earnings of Active Participants	$ 158,887,302	$ 159,724,878
Total Annual Benefits of Retired and Disabled Participants	68,014,757	66,095,371
Present Value of Plan Benefits (PVB)		
1. Active Participants		
a. Retirement (Immediate Pension)	$ 353,660,018	$ 357,693,478
b. Vested Termination (Pension Deferred to Normal Retirement)*	12,010,462	12,095,537
c. Death - Spouse's Benefit*	6,797,893	3,189,292
d. Disability*	5,829,595	6,012,458
e. Total Active PVB (a + b + c + d)	$ 378,297,968	$ 378,990,765
2. Retired and Disabled Participants Receiving Benefits	749,723,985	735,055,379
3. Terminated Participants with Deferred Benefits**	10,381,816	9,888,456
4. Refunds		
a. Accumulated Employee Contributions Credited to Account of Terminated Participants and Beneficiaries of Deceased Participants who have not received a refund	455,415	445,301
b. Nonvested Participants on Leave of Absence or Military Leave	17,408	5,962
c. Total Refunds (a + b)	$ 472,823	$ 451,263
Total Present Value of Benefits (1e + 2 + 3 + 4c)	$ 1,138,876,592	$ 1,124,385,863

*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.

1.5: Present Value of Accumulated Plan Benefits (PVAB)

	June 30, 2021	June 30, 2020
1. Actuarial present value of vested benefits (PVVB)		
a. Participants currently receiving payments		
(retired and disabled participants and beneficiaries)	$749,723,985	$735,055,379
b. Other participants		
i. Active participants	203,968,106	194,860,248
ii. Deferred vested participants/refunds	10,854,639	10,339,719
iii. Total	214,822,745	205,199,967
c. Total PVVB (a. + b.)	$964,546,730	$940,255,346
2. Actuarial present value of non-vested benefits	6,098,176	10,089,669
3. Total actuarial present value of accumulated plan benefits (PVAB) (1.c. + 2.)	$970,644,906	$950,345,015
4. Market value of assets	974,626,269	773,168,364
5. Ratio of Assets to PVAB (4. ÷ 3.)	100.4%	81.4%

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.

1.6: Change in Present Value of Accumulated Plan Benefits

1. Actuarial present value of accumulated plan benefits (PVAB) as of July 1, 2020	$ 950,345,015
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	64,214,148
5. Change due to benefits paid	(66,000,086)
6. Change due to benefits accumulated and plan experience	22,085,829
7. Actuarial present value of accumulated plan benefits (PVAB) as of June 30, 2021: (1 + 2 + 3 + 4 + 5 + 6)	$ 970,644,906

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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 January 1, 2016.
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.

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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 <u>plus</u> 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.

Early Retirement (continued)

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 made 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.

Disability Retirement (continued)

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, 2021		June 30, 2020	
1. Closed Plan Active Participants				
a. Number	4		4	
b. Average Age	70.24		69.24	
c. Average Years of Service	46.18		45.18	
d. Total Pay	$557,576		$557,114	
e. Average Pay	139,394		139,279	
2. Open Plan Active Participants				
a. Number	1,647		1,667	
b. Average Age	47.68		47.28	
c. Average Years of Service	11.91		11.76	
d. Total Pay	$152,328,226		$ 152,861,269	
e. Average Pay	92,488		91,698	
3. All Active Participants				
a. Number	1,651		1,671	
b. Average Age	47.73		47.33	
c. Average Years of Service	11.99		11.84	
d. Total Pay	$152,885,802		$ 153,418,383	
e. Average Pay	92,602		91,812	
4. Retired Participants and Beneficiaries				
a. Number	1,635		1,624	
b. Average Age	71.38		70.97	
c. Total Annual Pension	$67,150,321		$ 65,250,130	
d. Average Annual Pension	41,071		40,179	
5. Disabled Participants				
a. Number	43		44	
b. Average Age	65.60		65.69	
c. Total Annual Pension	863,649		$ 845,242	
d. Average Annual Pension	20,085		19,210	
6. Deferred Vested Participants				
a. Number	137	*	127	*
b. Average Age	51.98		51.81	
c. Total Annual Pension	$1,448,044		$ 1,394,527	
d. Average Annual Pension	10,570		10,981	

*Including vested Participants on Leave of Absence or Military Leave (5 for 2020 and 11 for 2010). Non-vested Participants who are on a Leave of Absence or Military Leave are not shown above (2 for 2020 and 3 for 2021).

Reconciliation of Closed Plan Participants

	Active	**Inactive**	**Retired and Beneficiaries**	**Deferred Vested**	**Disabled**	**Total**
Census as of June 30, 2020	4	0	745	0	6	755
Retired	0	0	0	0	0	0
Disabled	0	0	0	0	0	0
Died:						
With Beneficiary	0	0	-9	0	-1	-10
Without Beneficiary	0	0	-28	0	-1	-29
Refund Paid to Beneficiary	0	0	0	0	0	0
Refund Payable to Beneficiary	0	0	0	0	0	0
Beneficiaries Added	0	0	10	0	0	10
Terminated						
Vested	0	0	0	0	0	0
Non-vested: Refund Paid	0	0	0	0	0	0
Non-vested: Refund Payable	0	0	0	0	0	0
Vested and Paid Employee Contributions	0	0	0	0	0	0
Added	0	0	0	0	0	0
Went on Leave	0	0	0	0	0	0
Returned from Leave	0	0	0	0	0	0
Reinstated	0	0	0	0	0	0
Adjustments	0	0	0	0	0	0
Census as of June 30, 2020	4	0	718	0	4	726

Reconciliation of Open Plan Participants

	Active*	Inactive	Retired and Beneficiaries	Deferred Vested	Disabled	Total
Census as of June 30, 2019	1,667	7	879	122	38	2,713
Retired	-45	0	49	-4	0	0
Disabled	0	0	-2	0	2	0
Died:						
With Beneficiary	0	0	-10	-1	-1	-12
Without Beneficiary	0	0	-10	0	0	-10
Refund Paid to Beneficiary	-3	-1	0	0	0	-4
Refund Payable to Beneficiary	-1	0	0	0	0	-1
Beneficiaries Added	0	0	12	0	0	12
Terminated						
Vested	-11	-2	0	13	0	0
Non-vested: Refund Paid	-15	0	0	0	0	-15
Non-vested: Refund Payable	-22	-1	0	0	0	-23
Vested and Paid Employee Contributions	-5	0	0	-5	0	-10
Added	90	0	0	0	0	90
Went on Leave	-14	14	0	0	0	0
Returned from Leave	3	-3	0	0	0	0
Reinstated	3	0	0	0	0	3
Adjustments**	0	0	-1	1	0	0
Census as of June 30, 2021	1,647	14	917	126	39	2,743

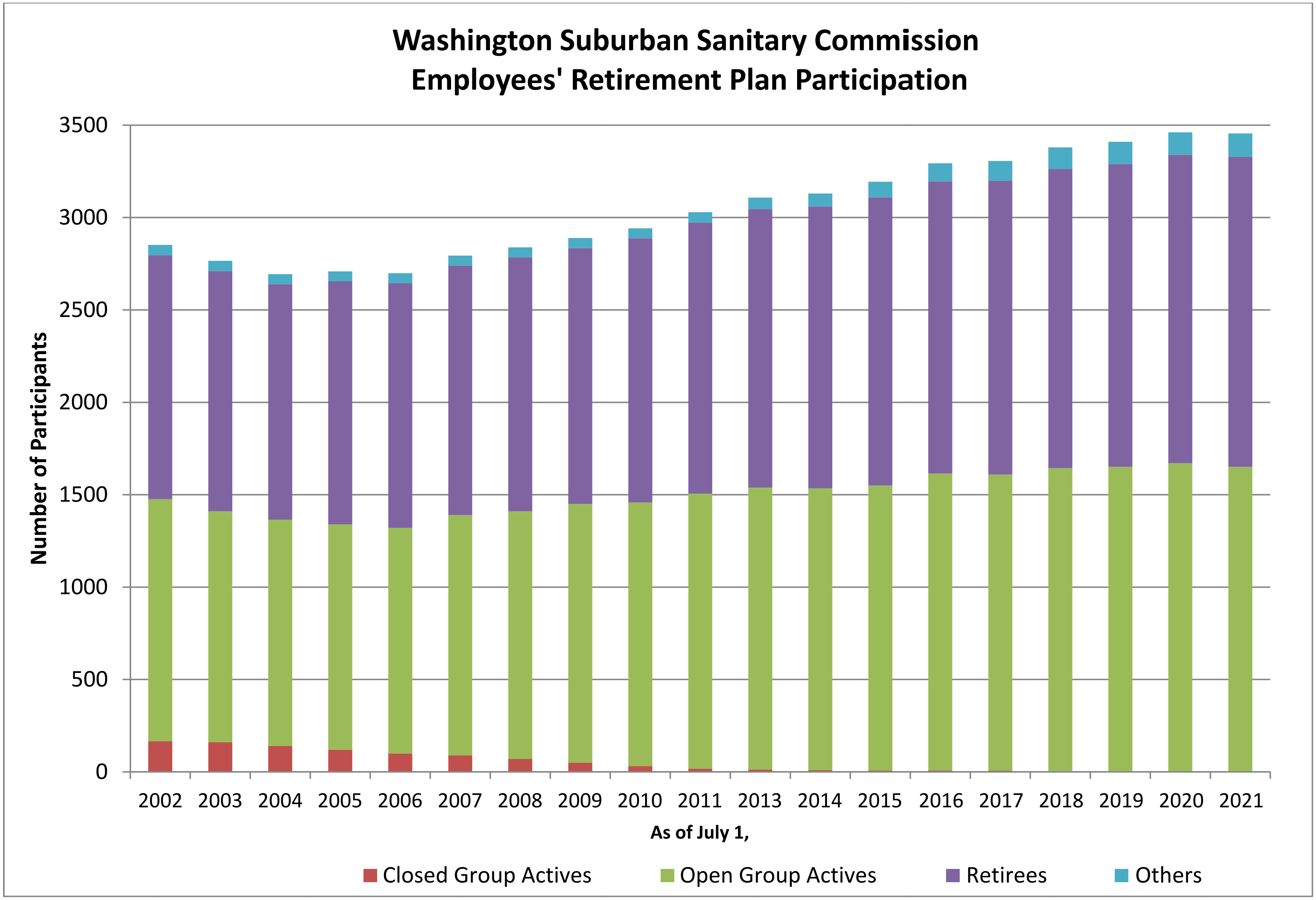
*Those with retiree payments stopped while reemployed are included in the active count.

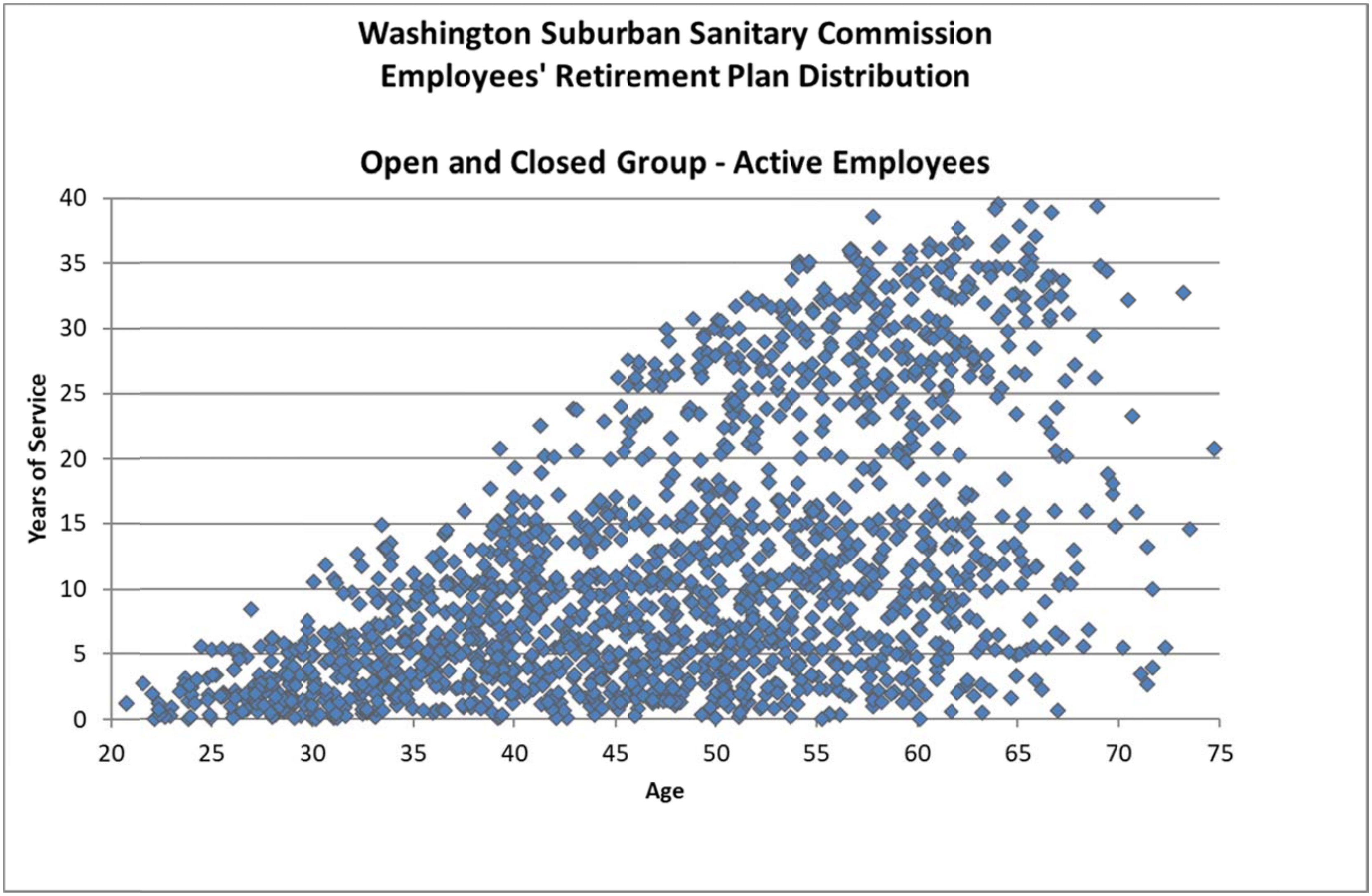
** Combined two retiree records for the same retiree into one retire record. Added terminated vested participant from prior year.

Active Participant Age/Service Distribution

SERVICE LEVEL

Age Group	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
MALE										
0 - 19	1	0	0	0	0	0	0	0	0	1
20 - 24	20	1	0	0	0	0	0	0	0	21
25 - 29	66	20	0	0	0	0	0	0	0	86
30 - 34	56	40	15	1	0	0	0	0	0	112
35 - 39	43	50	30	4	1	0	0	0	0	128
40 – 44	34	41	38	17	5	0	0	0	0	135
45 - 49	35	37	33	18	11	21	3	0	0	158
50 - 54	37	37	27	23	15	22	16	1	0	178
55 - 59	24	23	32	15	6	25	20	7	0	152
60 - 64	12	23	26	12	8	18	17	10	3	129
65 - 69	4	8	11	4	4	5	12	10	2	60
70+	3	1	0	5	2	0	1	0	2	14
Total	335	281	212	99	52	91	69	28	7	1,174
FEMALE										
0 – 19	0	0	0	0	0	0	0	0	0	0
20 - 24	1	0	0	0	0	0	0	0	0	1
25 - 29	10	0	0	0	0	0	0	0	0	10
30 - 34	26	6	1	0	0	0	0	0	0	33
35 - 39	22	23	11	2	0	0	0	0	0	58
40 – 44	20	18	11	4	2	0	0	0	0	55
45 - 49	23	19	4	5	8	2	0	0	0	61
50 - 54	20	19	13	10	6	8	4	2	0	82
55 - 59	13	11	14	8	12	7	12	5	0	82
60 - 64	6	10	8	5	4	14	10	8	0	65
65 - 69	1	4	1	1	3	3	7	2	3	25
70+	0	1	2	1	0	0	1	0	0	5
Total	142	111	65	36	35	34	34	17	3	477


Washington Suburban Sanitary Commission
Employees' Retirement Plan Participation
Number of Participants
0
500
1000
1500
2000
2500
3000
3500
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2013
2014
2015
2016
2017
2018
2019
2020
2021
As of July 1,
Closed Group Actives
Open Group Actives
Retirees
Others


Washington Suburban Sanitary Commission
Employees' Retirement Plan Distribution
Open and Closed Group - Active Employees
Years of Service
0
5
10
15
20
25
30
35
40
Age
20
25
30
35
40
45
50
55
60
65
70
75

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.

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, 2021

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.

8. Salary Increases

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

Years of Service	Increase
Up to 4	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 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.

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. Husbands are assumed to be three years older than their wives.

14. Option election

It is assumed that one-half of retiring participants will elect a joint and two-thirds survivor pension.

15. Sick Leave credit

It is assumed that an active participant will earn an additional 0.018 years of service credit for sick leave each year.

There are no changes in methods and assumptions since the prior valuation.

SECTION 3: PROJECTIONS OF PLAN FUNDING

3.1: 15-Year Projection of Cash Flows

Based on 16.9% of Payroll Level Contribution Rate

Plan Year Beginning July 1	MVA at Beginning of Year	AVA at Beginning of Year	Contributions WSSC Water	Contributions Employee	Benefit Payments	Estimated Investment Income*	Net Increase in Fund
2021	$974,626,269	$870,314,780	$26,449,752	$4,667,665	$64,948,315	$67,059,784	$33,228,886
2022	1,007,855,155	899,405,871	26,669,624	4,742,260	66,173,560	69,353,780	34,592,104
2023	1,042,447,259	960,538,249	27,239,060	4,841,150	67,832,227	71,741,151	35,989,134
2024	1,078,436,393	1,028,546,388	27,851,051	4,946,402	69,603,418	74,224,126	37,418,161
2025	1,115,854,554	1,109,208,098	28,571,847	5,072,533	71,385,710	76,811,213	39,069,883
2026	1,154,924,436	1,154,924,436	29,390,252	5,217,646	73,037,460	79,522,425	41,092,863
2027	1,196,017,299	1,196,017,299	30,361,729	5,389,656	74,736,089	82,379,824	43,395,120
2028	1,239,412,419	1,239,412,419	31,470,538	5,586,486	76,513,337	85,401,255	45,944,942
2029	1,285,357,361	1,285,357,361	32,742,490	5,812,276	78,265,912	88,608,632	48,897,486
2030	1,334,254,847	1,334,254,847	34,154,671	6,062,959	79,911,962	92,032,035	52,337,703
2031	1,386,592,550	1,386,592,550	35,729,923	6,342,590	81,361,699	95,709,614	56,420,428
2032	1,443,012,978	1,443,012,978	37,462,294	6,650,111	82,784,885	99,680,264	61,007,784
2033	1,504,020,762	1,504,020,762	39,364,538	6,987,788	83,934,822	103,988,313	66,405,817
2034	1,570,426,579	1,570,426,579	41,424,993	7,353,549	84,964,170	108,684,784	72,499,156
2035	1,642,925,735	1,642,925,735	43,674,049	7,752,790	85,790,928	113,822,400	79,458,311

*Assuming 7.00% returns each year.

MVA = Market Value of Assets
AVA = Actuarial Value of Assets

Additional Assumptions for Projections:

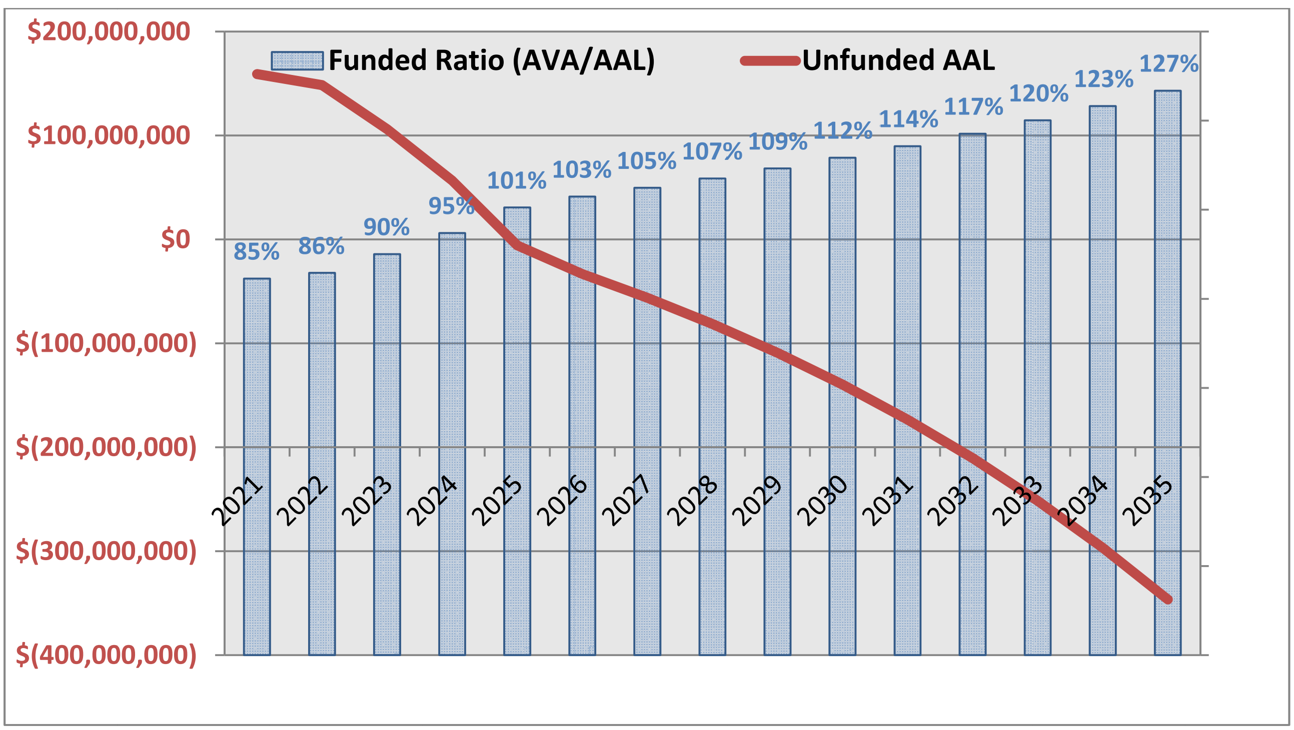
The cost of future entrants is estimated by projecting future replacements of assumed decrements (retirements, terminations, disablements or deaths).

We also assumed that future participants are similar to those who entered the plan since the last three actuarial valuation reports were issued, including this current report -- specifically 67% male and 33% female, with average age = 38, and a starting salary equal to the current average of $72,100. We assumed salary at entry would increase each year at the assumed salary scale.

3.2: 15-Year Projection of Funding Progress

Based on 16.9% of Payroll Level Contribution Rate

Plan Year Beginning July 1	AVA at Beginning of Year	Actuarial Accrued Liability (AAL)	Funded Ratio (AVA/AAL)	Unfunded AAL	Present Value of Future Benefits (PVFB)	Percent of PVFB Funded
2021	$870,314,780	$1,029,388,640	85%	$159,073,860	$1,138,876,592	86%
2022	899,405,871	1,047,938,641	86%	148,532,771	1,155,810,047	87%
2023	960,538,249	1,066,633,424	90%	106,095,176	1,172,744,355	89%
2024	1,028,546,388	1,085,215,531	95%	56,669,143	1,189,260,571	91%
2025	1,109,208,098	1,103,582,681	101%	(5,625,417)	1,205,220,647	93%
2026	1,154,924,436	1,121,764,602	103%	(33,159,835)	1,220,574,922	95%
2027	1,196,017,299	1,139,933,830	105%	(56,083,469)	1,235,407,188	97%
2028	1,239,412,419	1,158,120,132	107%	(81,292,287)	1,249,635,587	99%
2029	1,285,357,361	1,176,314,386	109%	(109,042,975)	1,263,141,844	102%
2030	1,334,254,847	1,194,627,023	112%	(139,627,824)	1,275,899,260	105%
2031	1,386,592,550	1,213,249,026	114%	(173,343,524)	1,287,958,398	108%
2032	1,443,012,978	1,232,489,435	117%	(210,523,543)	1,299,460,163	111%
2033	1,504,020,762	1,252,500,240	120%	(251,520,521)	1,310,391,205	115%
2034	1,570,426,579	1,273,705,854	123%	(296,720,725)	1,320,975,734	119%
2035	1,642,925,735	1,296,396,454	127%	(346,529,281)	1,331,306,073	123%



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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. The second 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. A 20-year amortization is used in each case.

1. **Investment Return Risk**

As of 6/30/2021 ($ mm)	Current Return Assumption (7%)	6.00% Return Assumption
Actuarial Liability	$1,029.4	$1,141.6
Plan Assets	870.3	870.3
Unfunded Liability	$159.1	$271.3
Funding Ratio	85%	76%
Actuarially Determined Employer Contribution	$23.1	$36.7
% of Payroll	14.8%	23.5%

2. **Longevity Risk**

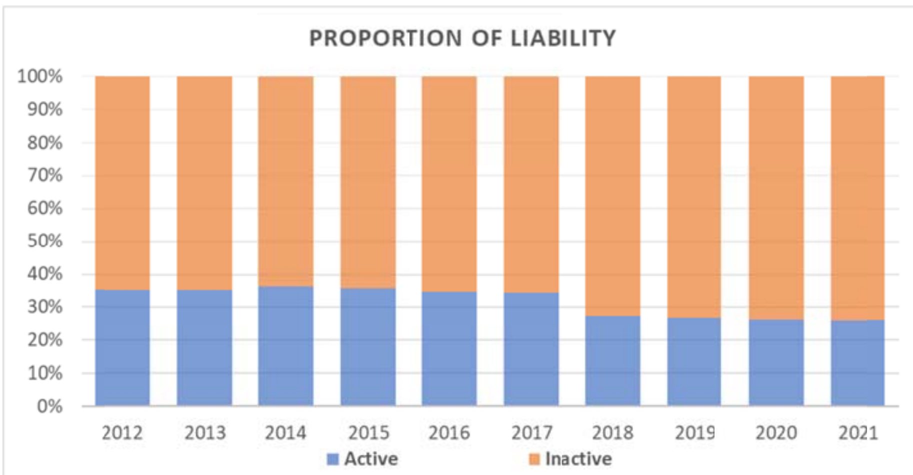
As of 6/30/2021 ($ mm)	Current Mortality Assumption	10% Lower Mortality Rates
Actuarial Liability	$1,029.4	$1,054.6
Plan Assets	870.3	870.3
Unfunded Liability	$159.1	$184.3
Funding Ratio	85%	83%
Actuarially Determined Employer Contribution	$23.1	$25.6
% of Payroll	14.8%	16.4%

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 52% inactive (by headcount) as of June 30, 2021. However, as shown in the graph below, the Plan liability has increased from about 65% inactive in 2011 to 74% in 2021, indicating continued maturing/aging.



The fund has experienced negative cash flow (disbursements greater than contributions) of approximately $30 million per year over the last decade. This is another indication of a very mature plan. As the Plan's funding approaches 100% and the contribution rate remains higher than the actuarial rate, this not a concern, because investment returns are used to finance benefit payments.