



Washington Suburban Sanitary Commission



Water and Sewer System Development Charge Study

**Final Report
February 2018**



Municipal & Financial Services Group

February 13, 2018

Letitia Carolina-Powell
Budget Division Manager
Washington Suburban Sanitary Commission
14501 Sweitzer Lane
Laurel, MD 20707

Reference: Water and Sewer System Development Charge Study

Dear Ms. Carolina-Powell,

The Municipal & Financial Service Group is pleased to submit to the Washington Suburban Sanitary Commission this report summarizing the water and sewer system development charge study. This document represents the results of our analysis which provides an evaluation of WSSC's system development charges, including detailed calculation of the charges and benchmarking of the charges with those of other utilities in Maryland and Virginia.

It has been our distinct pleasure to work with the Commission on another endeavor. The assistance provided by management and staff was essential to the completion of the study. The dedication of everyone who assisted in the study process should be acknowledged and was vital to the success of the study. Thank you for the opportunity to work with the WSSC on this important project.

Very truly yours,

Michael Maker
Senior Manager
Municipal & Financial Services Group

TABLE OF CONTENTS

1. Background	1
2. Current System Development Charges	1
Exhibit 2.1.1 Current System Development Charges	1
3. Calculation Methodology.....	1
4. Net Replacement Cost of Assets	2
Exhibit 4.1.1 Net Replacement Cost of Assets Calculation	2
5. Units of Capacity	3
Exhibit 5.1.1 Capacity Fixture Units	3
6. SDC Calculation	4
Exhibit 6.1.1 SDC Calculation	4
7. Proposed SDCs	4
Exhibit 7.1.1 Proposed System Development Charges	4
8. System Development Charge Comparison.....	5
Exhibit 8.1.1 System Development Charge Comparison - Single Family	6
Exhibit 8.1.2 Combined System Development Charge Comparison - Single Family	7

1. Background

WSSC collects system development charges from new customers joining the water and sewer systems. System development charges (SDCs) are charges levied on new development to pay for the construction of major water and sewerage facilities needed to accommodate growth. Water and sewer system development charges are discussed below with any suggested changes/modifications.

2. Current System Development Charges

WSSC's current SDCs are charged based on the number of fixture units (i.e., plumbing fixtures such as toilets, sinks, baths, etc.) within a property, with the charge per fixture unit being \$88.00 for water and \$115.00 for sewer. There is a specific charge identified for apartments and three charges for residential properties based on the number of toilets. The current system development charges are shown in Exhibit 2.1.1.

Exhibit 2.1.1 Current System Development Charges

Property Type	Water	Sewer	Combined
Apartment	\$896.00	\$1,140.00	\$2,036.00
1-2 toilets / residential	\$1,344.00	\$1,710.00	\$3,054.00
3-4 toilets / residential	\$2,240.00	\$2,850.00	\$5,090.00
5 toilets / residential	\$3,135.00	\$3,991.00	\$7,126.00
6+ toilets / residential (per fixture unit)	\$88.00	\$115.00	\$203.00
Non-residential (per fixture unit)	\$88.00	\$115.00	\$203.00

3. Calculation Methodology

System development charges were evaluated using the system buy-in method (also referred to as the equity method) which reflects the cost of buying into the current system, or the average equity of existing customers. This calculation is often used in a utility which has sufficient capacity to serve both current and new customers. The methodology used follows the methodologies referenced in American Water Works Association's *Principles of Water Rates, Fees, and Charges* (AWWA Manual M1) and Water Environment Federation's *Financing Charges for Wastewater Systems* (WEF Manual of Practice No. 27). The calculation is essentially the replacement cost of assets (net depreciation and outstanding principal on debt) divided by units of capacity.

4. Net Replacement Cost of Assets

The following steps were taken to calculate the replacement cost of assets to be included in the SDC calculation:

1. The original cost of each of WSSC's fixed assets was escalated to replacement cost in today's dollars, using the Construction Cost Index published by *Engineering News Record*. Then, the percent to which each asset was already depreciated was used to calculate the replacement cost less depreciation, referred to as "replacement cost new less depreciation" or "RCNLD". Using RCNLD reflects the replacement value of WSSC's assets while taking into consideration the remaining depreciable life of the assets and equitably compensates existing customers for the excess capacity that is available for development. Next, the eligibility for the SDC calculation of each asset was determined. Since an SDC recovers the capital costs of backbone capacity in the water and sewer systems and WSSC already recovers the capital costs of constructing distribution and collection mains through front foot benefit charges, water and sewer mains with diameters 14 inches or less (used as a proxy for distribution and collection mains) were excluded from the SDC calculation. Multiplying the RCNLD asset values by their percent eligible for the SDC calculation results in the valuation for the SDC calculation.
2. Projects within WSSC's approved FY 2018 – FY 2023 capital improvement plan that invest in the backbone system (storage, treatment, transmission and conveyance projects) were added to the SDC calculation as they contribute to WSSC's asset base as they are constructed.
3. The present value of outstanding principal on debt was subtracted from the SDC calculation to avoid charging customers twice (through SDCs and user rates) since debt issued for projects is typically recovered through user rates (which SDC customers end up paying once they join the system).
4. Adding the replacement cost (less depreciation) of assets to the eligible capital project costs and subtracting the present value of outstanding principal on debt results in the net replacement cost.

The components of the SDC net replacement cost calculation are shown for water and sewer in Exhibit 4.1.1:

Exhibit 4.1.1 Net Replacement Cost of Assets Calculation

Step	SDC Cost Component (\$, millions)	Water	Sewer
1	Replacement Cost New Less Depreciation (RCNLD)	\$2,083.7	\$3,281.2
2	Capital Projects	\$1,260.7	\$1,609.5
3	Less Present Value of Outstanding Principal on Existing Debt	(\$702.0)	(\$1,089.2)
4	Net Replacement Cost	\$2,642.4	\$3,801.5

5. Units of Capacity

The following steps were taken to calculate the service units to be included in the SDC calculation:

1. The design capacity of the treatment facilities was calculated. WSSC owns two water treatment facilities (Potomac and Patuxent) which have a combined water treatment capacity of 345.0 million gallons per day (mgd). WSSC owns six wastewater treatment facilities (Piscataway Creek, Seneca, Damascus, Western Branch, Parkway and Hyattstown) and has purchased 169.6 mgd of treatment capacity at the Blue Plains Regional Wastewater Treatment Plant in Washington, DC, 3.0 mgd of capacity at the Mattawoman wastewater treatment in northern Charles County and 0.02 mgd (20,000 gallons per day) of capacity in the Town of Poolesville's wastewater treatment plant. This equals a combined sewer treatment capacity of 271.64 mgd.
2. Based on WSSC's previously calculated average water residential usage and peaking factor, a water equivalent dwelling unit planned required capacity of 339.57 gpd was calculated. Based on WSSC's previously calculated average sewer residential usage and I&I factor, a sewer equivalent dwelling unit planned required capacity of 329.70 gpd was calculated.
3. Using the current "3-4 toilets / residential" SDC as the typical household size, the combined SDC of \$5,090.00 was divided by the per fixture unit SDC of \$203.00 resulting in approximately 25 fixture units per "3-4 toilets / residential" property type. The calculated water equivalent dwelling unit of 339.57 gpd was divided by 25 fixture units resulting in 13.58 gpd per fixture unit for water. The calculated sewer equivalent dwelling unit of 329.70 gpd was divided by 25 fixture units resulting in 13.19 gpd per fixture unit for sewer.
4. The water design capacity of 345.00 mgd was divided by the 13.58 gpd per fixture unit resulting in 25.4 million capacity fixture units, while the sewer design capacity of 271.64 mgd was divided by the 13.19 gpd per fixture unit resulting in 20.6 million capacity fixture units.

The components of the SDC capacity fixture units calculation for water and sewer are shown in Exhibit 5.1.1:

Exhibit 5.1.1 Capacity Fixture Units

Step	Units of Capacity Component	Water	Sewer
1	Current Capacity (mgd)	345.00	271.64
2	Equivalent Dwelling Unit (EDU, in gpd)	339.57	329.70
3	GPD/Fixture Units	13.58	13.19
4	Capacity Fixture Units (millions)	25.4	20.6

6. SDC Calculation

To calculate the SDC per capacity fixture unit, the net replacement cost was divided by the capacity fixture units, resulting in an SDC per fixture unit for water of \$104.03 (or \$104.00 rounded to the nearest dollar) and an SDC per fixture unit for sewer of \$184.56 (or \$185.00 rounded to the nearest dollar), as shown in Exhibit 6.1.1.

Exhibit 6.1.1 SDC Calculation

SDC Calculation Component	Water	Sewer
Net Replacement Cost (\$, millions)	\$2,642.4	\$3,801.5
Current Capacity Fixture Units (millions)	25.4	20.6
SDC per Fixture Unit	\$104.03	\$184.56
SDC per Fixture Unit (rounded to the nearest dollar)	\$104.00	\$185.00

7. Proposed SDCs

FY 2019 proposed system development charges using WSSC's charge basis and the calculation methodology described above are presented (along with WSSC's current SDCs) in Exhibit 7.1.1.

Exhibit 7.1.1 Proposed System Development Charges

Property Type	Current			FY 2019 Proposed		
	Water	Sewer	Combined	Water	Sewer	Combined
Apartment	\$896.00	\$1,140.00	\$2,036.00	\$1,040.00	\$1,850.00	\$2,890.00
1-2 toilets / residential	\$1,344.00	\$1,710.00	\$3,054.00	\$1,560.00	\$2,775.00	\$4,335.00
3-4 toilets / residential	\$2,240.00	\$2,850.00	\$5,090.00	\$2,600.00	\$4,625.00	\$7,225.00
5 toilets / residential	\$3,135.00	\$3,991.00	\$7,126.00	\$3,640.00	\$6,475.00	\$10,115.00
6+ toilets / residential (per fixture unit)	\$88.00	\$115.00	\$203.00	\$104.00	\$185.00	\$289.00
Non-residential (per fixture unit)	\$88.00	\$115.00	\$203.00	\$104.00	\$185.00	\$289.00

8. System Development Charge Comparison

As part of the system development charge analysis, a comparison of WSSC's SDC methodology and charges was developed. Exhibit 8.1.1 provides a comparison of system development charges for surrounding utilities in Maryland and Virginia (sorted alphabetically within each state). The SDC calculations in the last three columns represent the cost for a single family residence to connect to the respective utility's system; the comparison is for the smallest meter size allowable by the utility for a single family residence (WSSC's standard for new developments is 1 inch), 3 toilets and 25 fixture units in order to provide an apples to apples comparison of utilities with different charge methodologies.

As shown in Exhibit 8.1.1, the charge or fee imposed by other utilities equivalent to an SDC at WSSC can be referenced as several different names, such as a "connection fee", "impact fee", "capacity fee", "availability fee" (which is common in Virginia) or some other name.

The methodology for calculating SDCs also varies by utility. Like WSSC, some of the comparison utilities (such as Frederick County, Arlington County and Fairfax County) base the charge on the number of fixture units in the property, some (such as Baltimore County, Howard County Fairfax Water and Loudoun Water) base it on meter size and others (Anne Arundel County, Harford County and Prince William County Service Authority) base it on equivalent dwelling unit (EDU) or equivalent residential unit (ERU). While the meter size basis is the most common methodology in the industry and the easiest to administer, the fixture unit basis (which WSSC uses) provides for a greater level of accuracy when calculating water and sewer demands.

Exhibit 8.1.1 System Development Charge Comparison - Single Family

State	Utility	Name	Methodology	Water SDC	Sewer SDC	Combined SDC
Maryland	WSSC (Current)	System Development Charge	toilets/fixture units	\$2,240	\$2,850	\$5,090
	Anne Arundel County	Capital Facility Connection Charge	equivalent dwelling units (EDUs)	\$6,855	\$6,855	\$13,710
	Baltimore County	Systems Connection Charge	meter size	\$575	\$875	\$1,450
	Frederick County	Capacity Fee	dwelling units/fixture units	\$5,160	\$7,202	\$12,362
	Harford County	System Development Fee	equivalent dwelling units (EDUs)	\$3,735	\$7,714	\$11,449
	Howard County	House Connection Charge	meter size	\$2,400	\$4,500	\$6,900
Virginia	Arlington County	Infrastructure Availability Fee	drainage fixture units (DFUs)	\$2,125	\$2,875	\$5,000
	Fairfax Water/Fairfax County	Availability Charge	meter size/fixture units	\$4,100	\$8,100	\$12,200
	Loudon Water	Availability Charge	meter size	\$6,766	\$8,209	\$14,975
	PWCSA	Availability Fee	meter size/equivalent residential units (ERUs)	\$4,600	\$10,800	\$15,400

Exhibit 8.1.2 provides a comparison of the combined (water and sewer) system development charges for WSSC with surrounding utilities. The utilities and numbers shown are the same as those in Exhibit 8.1.1, sorted in descending order by combined charge total. The single family residence is assumed to have the smallest meter size allowable by the utility for a single family residence (WSSC's standard for new developments is 1 inch), 3 toilets and 25 fixture units in order to provide an "apples to apples" comparison of utilities with different charge methodologies. While the most current charges available were used in the comparison, the amounts may not reflect unknown increases within the comparison utilities.

Exhibit 8.1.2 Combined System Development Charge Comparison - Single Family

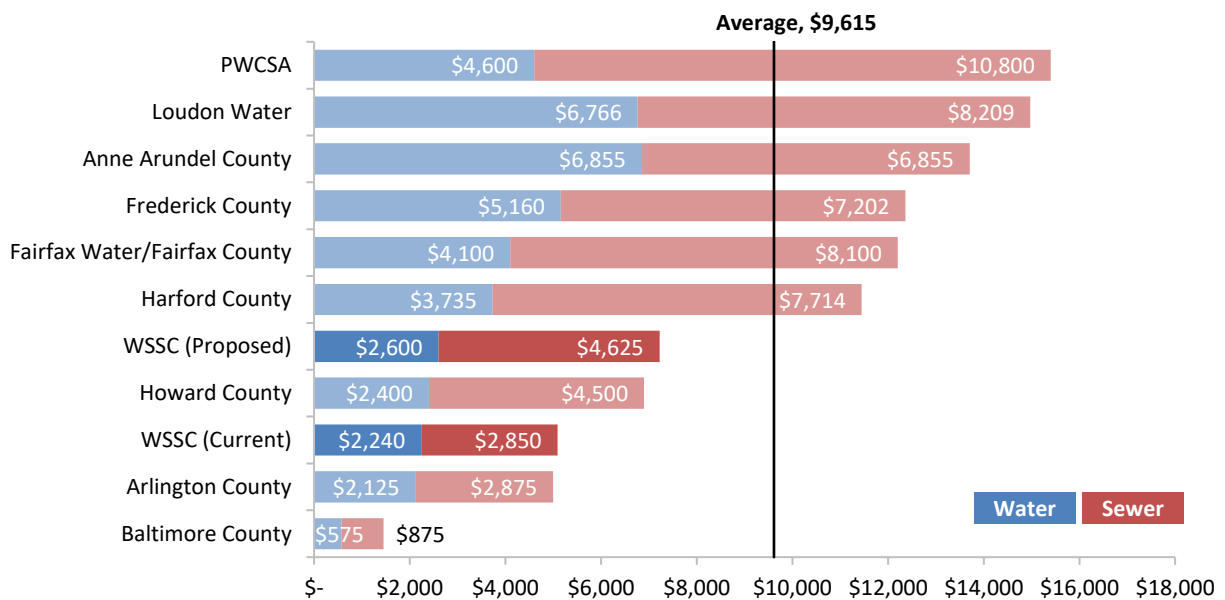


Exhibit 8.1.2 shows that for a typical single family connection, the combined proposed system development charge for WSSC remains lower than the average for the comparison utilities.