

Capacity Charge Rate Structure Evaluation Study

Staff Report
August 27, 2019

Introduction

The King County capacity charge is designed to implement the policy of newly connecting customers paying their fair share of the costs of providing wastewater conveyance and treatment services to a growing region. To this end, every three years, the supporting data which determine the total revenue requirements of the capacity charge are updated to reflect the expected number of new connections and the expected costs of building necessary treatment and conveyance facilities to serve the increasing customer base into the future.

To distribute these costs across customers, the Wastewater Treatment Division (WTD) established a rate structure for the capacity charge, with customer classes defined by building type. This framework approved by Council in 2001 is based on a survey of other agencies' approaches. A key principle is that the distribution should be equitable, meaning that it should be commensurate with customers' impact on the system and not overburden one customer class relative to another. This is of even greater importance in the region now, given the current challenges related to housing affordability.¹ The rate structure should reflect the current context of real estate development and water use in the region. King County must also consider other factors in establishing rate structures, including administrative feasibility, transparency and reasonableness. This study assessed the current rate structure and alternatives with all these objectives in mind.

Current System and Purpose of Study

To date, the main capacity charge customer classes have been single detached, small multifamily with four or fewer units, large multifamily with five or more units, and commercial/non-residential.² Single detached units are considered one residential customer, multifamily structures are assigned a portion of a Residential Customer Equivalent (RCE) for each unit in the building—0.8 RCEs for small multifamily, and 0.64 RCEs for large multifamily—and commercial buildings are assigned RCEs based on fixture counts.

This framework has not been comprehensively evaluated or updated since it was established. In recent years, the characteristics of new buildings and water use changed significantly, including:

- Micro-housing³
- Small Efficiency Dwelling Units (SEDUs)⁴
- Attached and Detached Accessory Dwelling Units (ADUs and DADUs)
- Dedicated facilities to support homeless populations
- Increased need for low-income or affordable housing
- Greater number of larger single detached homes

To determine what changes could improve the capacity charge rate structure, this study evaluated a range of options, considering wastewater impact; validity across structure types; ease of understanding; availability of accurate information at the time of connection; and potential for periodic updates using credible, readily-available data sources. WTD contracted with FCS Group for technical analysis. The Metropolitan Water Pollution Abatement Advisory Committee (MWPAAC) Rate Structure Evaluation Study Work Group

¹ To address affordability challenges directly, the King County Council approved several measures in June, 2019.

² Additional customer classes include senior, special purpose, and low income housing and zero discharge buildings.

³ Microhousing units are very small apartments built for one occupant, with shared kitchens and other facilities.

⁴ As described in Seattle Municipal Code, SEDUs are small studio apartments with kitchens.

(“Workgroup”)⁵ provided valuable input and guidance and conducted additional research. Representatives from real estate development organizations provided input in several meetings and phone calls. What follows is a summary of the key findings of the technical analysis, the Workgroup’s recommendation and two options WTD recommends for consideration.

Technical Analysis Results

FCS Group’s work⁶ included online research into the metrics and groups used by peer agencies across the US, quantitative analysis of available data on water use by WTD capacity charge customers and a survey to gauge the preferences of local sewer agencies.⁷ In its quantitative analysis, FCS Group tested a range of metrics to identify the best predictor of relative water consumption. These included water meter size, lot size, number of bedrooms, number of bathrooms, square footage, number of stories and number of units.

The statistical analysis showed that finished square footage was the best predictor of wet season water use for residential development. However, the predictive power of square footage was not robust.⁸ For commercial development, water meter size was a slightly better predictor than fixture counts. The survey of local sewer agencies demonstrated a strong preference for maintaining the basic framework of the existing rate structure. Agencies’ primary concerns consisted of administrative challenges related to collecting and verifying information on square footage.

The Workgroup did additional research related to the use of average persons per household (PPH) as a proxy for water usage in different residential structure types. The recommendation points to the intuitive logic behind linking water usage to the number of people. The Workgroup recommendation relies on high-quality public data published annually by the US Census Bureau, which provides a straightforward means of developing estimates of persons per household in different structures.⁹

Workgroup Research and Recommendations

The Workgroup’s recommendation is to maintain the current customer classes and continue to designate all single detached units as one residential customer. They propose:

- RCEs for large and small multifamily buildings be updated based on estimates of average PPH relative to PPH for single detached units on average for the County. This could result in minor changes to RCE allocations.¹⁰
- Revisions to the rate structure to clarify RCE factors for ADUs, DADUs and microhousing.
- Maintaining the existing practice of calculating RCEs for commercial buildings using fixture counts and a conversion factor based on the Universal Plumbing Code. Further study is recommended to evaluate alternatives, particularly the use of water meter size.

⁵ Local sewer agencies participating in the Workgroup consisted of the Cities of Bellevue, Renton, Redmond and Seattle, and Soos Creek Water and Sewer District and Alderwood Water and Wastewater District.

⁶ Summarized in *Wastewater Capacity Charge Rate Design Evaluation Final Report*, June 2019

⁷ Thirteen members representing 88% of WTD’s customer base responded to the survey: Cities of Auburn, Seattle, Brier, Kirkland, Bellevue, Kent, Issaquah, Redmond, and Tukwila, and Sammamish Plateau Water, Northshore Utility District, Soos Creek Water and Sewer District, and Valley View Sewer District.

⁸ Furthermore, FCS Group, WTD, and the Workgroup all acknowledge the available data set was not ideal. Not all agencies contributed data to the project, including WTD’s largest customer, City of Seattle.

⁹ The Workgroup suggests using estimates from the US Census Bureau’s American Community Survey.

¹⁰ This calculation could result in such minor changes to allocations that the Workgroup suggests a formal update to RCEs may not be necessary.

WTD Recommended Options

For commercial customers, WTD recommends maintaining the existing practice of establishing RCEs based on fixture count. Administrative procedures for this method are well-established and meet the needs of WTD, our local agency partners, and customers. If a customer or WTD has a concern that the amount being charged is not commensurate with wastewater flow, procedures are in place to verify or correct the number of RCEs assigned to a commercial structure. Water meter size is often determined by fire protection requirements, making it a problematic proxy for wastewater flow.

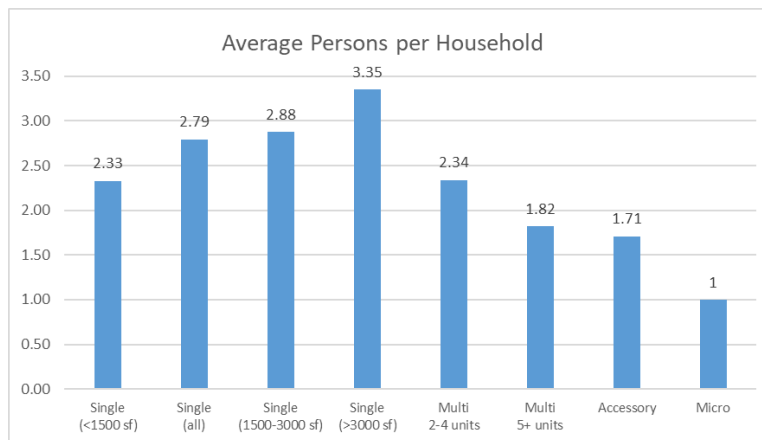
For residential structures, WTD is considering two options that build on the analysis and recommendations of FCS Group and the Workgroup.

Option 1 is essentially the same as the Workgroup's recommendation. It maintains the current customer classes and designation of all single detached dwelling units as one residential customer; updates multifamily structure RCEs based on PPH; and revises and clarifies RCEs for ADUs, DADUs¹¹ and microhousing¹².

Option 2 is distinguished from Option 1 in that it disaggregates single detached dwelling units into three separate customer classes of small, medium, and large.¹³ This acknowledges that larger single detached dwelling units on average have larger household sizes and place greater demands on the system, while smaller units demand less. The result is that the capacity charge would decrease for small single detached dwelling units and increase for large single detached dwelling units as compared to charges under the existing framework, as illustrated in Table 1.

Figure 1 summarizes the PPH assumptions WTD used to develop its options. Under both options a single detached dwelling unit customer class is designated as the base unit and the others are assigned RCEs reflecting average household size relative to that base.

Figure 1. PPH by Structure Type¹⁴



¹¹ In Options 1 and 2, the criteria to qualify as a DADUs is revised to include a maximum size of 1,000 square feet.

¹² The definition of microhousing for both Options 1 and 2 is clarified as a unit no larger than 400 square feet with eight or fewer plumbing fixture units and no in-unit kitchens.

¹³ The classes are defined by square footage, but the RCE factors assigned to each class of single detached dwelling units is determined based on estimates of average PPH in that size range.

¹⁴ Estimates are derived from the following sources: 2017 American Housing Survey estimates (single detached), 2017 American Community Survey 5-year estimates (multifamily), 2018 City of Portland study (accessory units), and WTD assumption of one person per unit for microhousing.

Under Options 1 and 2, changes in the RCEs for the various structure types are likely to result in a change in the total number RCEs across the whole set of capacity charge customers. In order to collect the same amount of revenue from a different number of RCEs, both options would require an adjustment to the charge per RCE.

Table 1 shows the estimated capacity charges for the various single detached dwelling unit types and multi-unit structures under the current rate structure and the two options. The amounts for Option 2 represent medium single detached dwelling units as the base unit defining one residential customer equivalent. Table 2 provides a more detailed comparison among the existing rate structure, Option 1 and Option 2. Table 3 provides an illustration of the effects of different size classes on the RCE values.

**Table 1. Estimated Total Capacity Charge by Option
Based on 2020 Monthly Capacity Charge**

Building Categories	Current	Option 1	Option 2
Single Detached (all)	\$66.35	\$65.52	-
Single Detached (<1,500 sf)	\$66.35	\$65.52	\$53.46
Single Detached (1,501-2,999 sf)	\$66.35	\$65.52	\$66.00
Single Detached (>3,000 sf)	\$66.35	\$65.52	\$76.56
MF (2-4 units)	\$53.08	\$55.03	\$53.46
MF (5+ units)	\$42.46	\$42.58	\$41.58
Accessory	\$39.81	\$39.96	\$38.94
Micro	\$23.22	\$23.59	\$23.10

Stakeholder Engagement and Next Steps

In addition to reviewing FCS Group's technical analysis and research plus recommendations from the Workgroup, WTD and FCS Group engaged a group of stakeholders to gather initial input on the current rate structure and possible changes. These included Master Builders' Association, individuals interested in accessory unit development, the Washington Multi-family Housing Association and individual developers of micro-housing. FCS Group conducted phone interviews with seven developers of single detached, multifamily or commercial projects.

Now that options have been identified, a key next step is to provide additional opportunities for stakeholders to provide input on the options. WTD will seek input from stakeholders, particularly housing developers, on the two options. The outreach will take place in August and September consisting of meetings, phone discussions, e-mails alerts to the possible changes, web-based materials and a survey open to stakeholders.

Table 2. Summary of Options

	Current	Option 1	Option 2
Basis for RCE	Historical	Persons per household	Persons per household
Base Unit	Single detached (all)	Single detached (all) 1 RCE = 2.79 PPH	Single detached (medium) 1 RCE = 2.88 PPH
Single Detached	All = 1 RCE	All = 1 RCE	Small ¹⁵ = 0.81 RCE Medium = 1 RCE Large = 1.16 RCE
Multifamily	2 to 4 units = 0.8 RCE 5+ units = 0.64 RCE	2 to 4 units = 0.84 RCE 5+ units = 0.65 RCE	2 to 4 units = 0.81 RCE 5+ units = 0.63 RCE
Detached Accessory Dwelling Units	0.6 RCE	0.61 RCE	0.59 RCE
Attached Accessory Dwelling Units	0.6 RCE	0.61 RCE	0.59 RCE
Micro-housing	Fixture count, approximately 0.35 RCE	0.36 RCE	0.35 RCE
Commercial Buildings	20 fixture units = 1 RCE	20 fixture units = 1 RCE	20 fixture units = 1 RCE
Pros	Requires no change in policy, administration or data analysis	Addresses emerging changes in housing Provides a basis for future updates High administrative feasibility for WTD and partner agencies Preferred by member agencies, based on survey	Addresses emerging changes in housing Provides a basis for future updates Recognizes larger homes typically have larger average household sizes and water use High administrative feasibility for WTD
Cons	Housing types change over time	Changes to equivalency factors will increase charge for some customers Does not reflect the variability in PPH depending on differences in square footage	Changes to equivalency factors will increase charge for some customers Lower administrative feasibility for partner agencies

¹⁵ In this example, single detached units are categorized as small (<1,500 sq. ft.), medium (1,500 – 2,999 sq. ft.) and large (3,000 sq. ft. and larger)

Table 3A. Residential Customer Equivalents (RCEs) by Potential Size Class¹

Boundaries		Single Detached			Multi-Unit			
Small is Under	Large is Over	Small	Medium	Large	MF 2-4	MF5+	ADU	Micro
Current		1.00	1.00	1.00	0.80	0.64	0.60	0.35
Option #1		1.00	1.00	1.00	0.84	0.65	0.61	0.36
1,000 sq ft	3,000 sq ft	0.73	1.00	1.20	0.84	0.66	0.62	0.36
1,000 sq ft	4,000 sq ft	0.72	1.00	1.39	0.83	0.64	0.60	0.35
1,500 sq ft	3,000 sq ft	0.81	1.00	1.16	0.81	0.63	0.59	0.35
1,500 sq ft	4,000 sq ft	0.80	1.00	1.34	0.80	0.62	0.58	0.34
2,000 sq ft	3,000 sq ft	0.89	1.00	1.15	0.81	0.63	0.59	0.34
2,000 sq ft	4,000 sq ft	0.87	1.00	1.32	0.79	0.61	0.57	0.34

Table 3B. Representative Monthly Capacity Charge Payment by Potential Size Class²

Boundaries		Single Detached			Multi-Unit			
Small is Under	Large is Over	Small	Medium	Large	MF 2-4	MF5+	ADU	Micro
Current		\$66.35	\$66.35	\$66.35	\$53.08	\$42.46	\$39.81	\$23.22
Option #1		\$65.52	\$65.52	\$65.52	\$55.03	\$42.58	\$39.96	\$23.59
1,000 sq ft	3,000 sq ft	\$46.34	\$63.48	\$76.18	\$53.33	\$41.90	\$39.36	\$22.85
1,000 sq ft	4,000 sq ft	\$46.99	\$65.27	\$90.72	\$54.17	\$41.77	\$39.16	\$22.84
1,500 sq ft	3,000 sq ft	\$53.46	\$66.00	\$76.56	\$53.46	\$41.58	\$38.94	\$23.10
1,500 sq ft	4,000 sq ft	\$53.73	\$67.16	\$90.00	\$53.73	\$41.64	\$38.95	\$22.84
2,000 sq ft	3,000 sq ft	\$58.94	\$66.22	\$76.16	\$53.64	\$41.72	\$39.07	\$22.52
2,000 sq ft	4,000 sq ft	\$59.22	\$68.07	\$89.86	\$53.78	\$41.52	\$38.80	\$23.14

Table 3C. Percent Change from Current Monthly Capacity Charge Payment by Potential Size Class

Boundaries		Single Detached			Multi-Unit			
Small is Under	Large is Over	Small	Medium	Large	MF 2-4	MF5+	ADU	Micro
Current		0%	0%	0%	0%	0%	0%	0%
Option #1		-1%	-1%	-1%	4%	0%	0%	2%
1,000 sq ft	3,000 sq ft	-30%	-4%	15%	0%	-1%	-1%	-2%
1,000 sq ft	4,000 sq ft	-29%	-2%	37%	2%	-2%	-2%	-2%
1,500 sq ft	3,000 sq ft	-19%	-1%	15%	1%	-2%	-2%	-1%
1,500 sq ft	4,000 sq ft	-19%	1%	36%	1%	-2%	-2%	-2%
2,000 sq ft	3,000 sq ft	-11%	0%	15%	1%	-2%	-2%	-3%
2,000 sq ft	4,000 sq ft	-11%	3%	35%	1%	-2%	-3%	0%

Table 3D. Percent Distribution and Estimated Number of Annual Units by Potential Size Class

Boundaries		Single Detached (%)			Single Detached (Units) ³		
Small is Under	Large is Over	Small	Medium	Large	Small	Medium	Large
Current		all the same class			2,718		
Option #1		all the same class			2,718		
1,000 sq ft	3,000 sq ft	1%	56%	43%	33	1,530	1,155
1,000 sq ft	4,000 sq ft	1%	86%	13%	33	2,339	346
1,500 sq ft	3,000 sq ft	13%	44%	43%	358	1,205	1,155
1,500 sq ft	4,000 sq ft	13%	74%	13%	358	2,014	346
2,000 sq ft	3,000 sq ft	28%	29%	43%	768	795	1,155
2,000 sq ft	4,000 sq ft	28%	59%	13%	768	1,604	346

¹ RCEs equal the ratio of average persons per household for each category to the base residential class of single detached unit² Amounts based on current adopted 2020 Capacity Charge of \$66.35 and adjusted in Options 1 and 2 for revenue neutrality³ Estimates based on historical annual average of 3,900 single detached unit new connections and 2015-2019 King County Assessor data on new construction structure size